ORDER NO. SD8008-1779

Service Manual

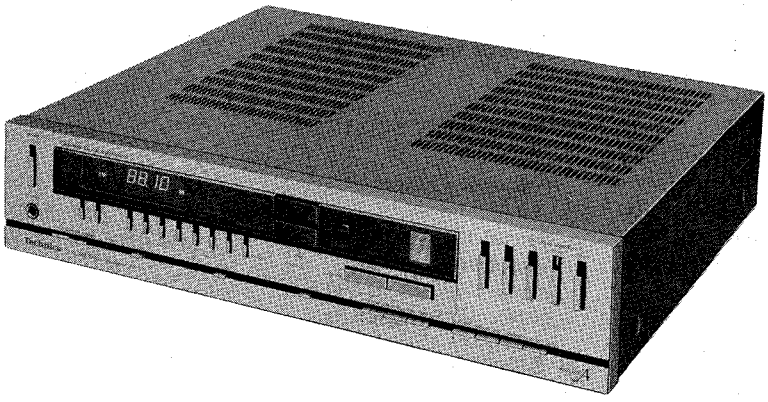
FM/AM Stereo Receiver

SA-515

[E], [EG], [XAL], [XA], [XGH], [EB]

SA-515 (K)

[E], [EG], [XGH]



* The cabinet, front panel and Knob are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

Areas

* [E] and [EG] are available in Scandinavia and European except Belgium and Holland.
* [XAL] is available in Australia.
* [XA] is available in Asia, Latin America, Middle East and Africa.
* [XGH] is available in Holland.
* [EB] is available in Belgium.

TECHNICAL SPECIFICATIONS (DIN 45 500)

(Specifications are subject to change without notice for further improvement.)

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output	
both channels driven	2 × 55W (4Ω)
	2 × 50W (8Ω)
40 Hz~16 kHz continuous power output	
both channels driven	2 × 55W (4Ω)
	2 × 50W (8Ω)
1 kHz continuous power output	
both channels driven	2 × 65W (4Ω)
	2 × 55W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.04% (4Ω)
	0.02% (8Ω)
rated power at 40 Hz~16 kHz	0.04% (4Ω)
	0.02% (8Ω)
rated power at 1 kHz	0.02% (4Ω)
	0.02% (8Ω)
half power at 20 Hz~20 kHz	0.015% (8Ω)
half power at 1 kHz	0.005% (8Ω)
−26 dB power at 1 kHz	0.1% (4Ω)
50 mW power at 1 kHz	0.12% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.04%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.02%
Power bandwidth	
both channels driven, −3 dB	5 Hz~35 kHz (4Ω)
	5 Hz~40 kHz (8Ω)
Residual hum and noise	0.5 mV
Damping factor	15 (4Ω), 30 (8Ω)
Input sensitivity and impedance	
PHONO	2.5 mV/47kΩ
AUX	150 mV/27kΩ
TAPE 2	150 mV/27kΩ
TAPE 1 REC/PLAY	180 mV/33kΩ
PHONO maximum input voltage (1 kHz, RMS)	150 mV
S/N	
rated power (4Ω)	
PHONO	73 dB (80 dB, IHF '66, 8Ω)
AUX, TAPE	88 dB (98 dB, IHF '66, 8Ω)
−26 dB power (4Ω)	
PHONO	64 dB
AUX, TAPE	66 dB
50 mW power (4Ω)	
PHONO	60 dB
AUX, TAPE	60 dB
Frequency response	
PHONO	RIAA standard curve
	±0.3 dB (30 Hz~15 kHz)
AUX, TAPE	5 Hz~70 kHz (−3 dB)
	±0.5 dB (20 Hz~20 kHz)
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	10 kHz, +10 dB~ −10 dB
Subsonic filter	30 Hz, −6 dB/oct.
High-cut filter	7 kHz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Muting	−20 dB

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Output voltage	
TAPE 1, 2 REC OUT	150 mV
TAPE 1 REC/PLAY	30 mV/82kΩ
Channel balance, AUX 250 Hz~6,300 Hz	±1.0 dB
Channel separation, AUX 1 kHz	55 dB
Headphones output level and impedance	470 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz (50 kHz step) 87.9~107.9 MHz (200 kHz step)
Sensitivity	
S/N 30 dB	1.9 μV (300Ω), 1.3 μV (75Ω)
S/N 26 dB	1.7 μV (300Ω), 1.2 μV (75Ω)
S/N 20 dB	1.5 μV (300Ω), 0.9 μV (75Ω)
IHF usable sensitivity	1.9 μV (IHF '58)
IHF 46 dB stereo quieting sensitivity	22 μV/75Ω
Total harmonic distortion (normal)	
MONO	0.1%
STEREO	0.3%
S/N	
MONO	68 dB (74 dB, IHF)
STEREO	64 dB (68 dB, IHF)
Frequency response	20 Hz~15 kHz, +1 dB~ −2 dB
Alternate channel selectivity	
normal, ±400 kHz	75 dB
narrow, ±300 kHz	75 dB
Capture ratio (normal)	1.2 dB
Image rejection at 98 MHz	75 dB
IF rejection at 98 MHz	90 dB
Spurious response rejection at 98 MHz	100 dB
AM suppression	55 dB
Stereo separation (normal)	
1 kHz	45 dB
10 kHz	35 dB
Carrier leak	
19 kHz	−30 dB (−38 dB, IHF)
38 kHz	−50 dB (−50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth (normal)	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	300Ω (balanced) 75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	522~1611 kHz (9 kHz step) 530~1620 kHz (10 kHz step)
***Sensitivity* (S/N 20 dB)**	30 μV, 250 μV/m
Selectivity	55 dB
Image rejection at 999 kHz	50 dB
IF rejection at 999 kHz	40 dB

■ GENERAL

Power consumption	530W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 97 × 382 mm (16-15/16" × 3-13/16" × 15-1/32")
Weight	10.1 kg (22.27 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

■ TECHNISCHE DATEN (DIN 45 500)

(Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz	
beide Kanäle ausgesteuert	2 × 55W (4 Ω) 2 × 50W (8 Ω)
Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz	
beide Kanäle ausgesteuert	2 × 55W (4 Ω) 2 × 50W (8 Ω)
Dauerton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 × 65W (4 Ω) 2 × 55W (8 Ω)
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0,04% (4 Ω) 0,02% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,04% (4 Ω) 0,02% (8 Ω)
Nennleistung bei 1 kHz	0,02% (4 Ω) 0,02% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0,015% (8 Ω)
halbe Nennleistung bei 1 kHz	0,005% (8 Ω)
−26 dB Leistung bei 1 kHz	0,1% (4 Ω)
50 mW Leistung bei 1 kHz	0,12% (4 Ω)
Intermodulationsfaktor	
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,04%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,02%
Leistungsbandbreite	
beide Kanäle ausgesteuert bei −3 dB	5 Hz ~ 35 kHz (4 Ω) 5 Hz ~ 40 kHz (8 Ω)
Restbrumm und Geräusch	0,5 mV
Dämpfungsfaktor	15 (4 Ω), 30 (8 Ω)
Eingangsempfindlichkeit und -impedanz	
Phono	2,5 mV/47 kΩ
Aux	150 mV/27 kΩ
Tape 2	150 mV/27 kΩ
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)	180 mV/33 kΩ
Maximale TA-Eingangsspannung (1 kHz, eff.)	150 mV
Geräuschabstand	
Nennleistung (4 Ω)	
Phono	73 dB (80 dB, nach IHF '66, 8Ω)
Aux, Tape	88 dB (98 dB, nach IHF '66, 8Ω)
−26 dB Leistung (4 Ω)	
Phono	64 dB
Aux, Tape	66 dB
50 mW Leistung (4 Ω)	
Phono	60 dB
Aux, Tape	60 dB
Frequenzgang	
Phono	RIAA-Standardkurve ±0,3 dB (30 Hz ~ 15 kHz)
Aux, Tape	5 Hz ~ 70 kHz (−3 dB) ±0,5 dB (20 Hz ~ 20 kHz)
Klangregler	
Baßregler (BASS)	50 Hz, +10 dB ~ −10 dB
Höhenregler (TREBLE)	10 kHz, +10 dB ~ −10 dB
Tiefenfilter	30 Hz, −6 dB/Okt.
Rauschfilter	7 kHz, −6 dB/Okt.
Gehörrichtige Lautstärkekorrektur (Loudness)	
(bei −30 dB Ausgangsleistung)	50 Hz, +9 dB
Tondämpfung	−20 dB

Ausgangsspannung	
Tape 1/2 Aufnahme (Tape 1, 2 REC OUT)	150 mV
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)	30 mV/82 kΩ
Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)	±1,0 dB
Übersprechdämpfung (Aux, 1 kHz)	55 dB
Kopfhörerpegel und -impedanz	470 mV/330 Ω
Lautsprecherimpedanz	
MAIN oder REMOTE	4 Ω ~ 16 Ω
MAIN und REMOTE	8 Ω ~ 16 Ω

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,00 MHz (50 kHz step) 87,9 ~ 107,9 MHz (200 kHz step)
Eingangsempfindlichkeit	
S/R 30 dB	1,9 μV (300 Ω), 1,3 μV (75 Ω)
S/R 26 dB	1,7 μV (300 Ω), 1,2 μV (75 Ω)
S/R 20 dB	1,5 μV (300 Ω), 0,9 μV (75 Ω)
Nutzempfindlichkeit nach IHF	1,9 μV (nach IHF '58)
Stereoumschaltschwelle bei 46 dB nach IHF	22 μV/75 Ω
Gesamtklirrfaktor (normal)	
Mono	0,1%
Stereo	0,3%
Geräuschabstand	
Mono	68 dB (74 dB nach IHF)
Stereo	64 dB (68 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+1 dB ~ −2 dB)
Trennschärfe bei Störsender	
normal, ±400 kHz	75 dB
schmal, ±300 kHz	75 dB
Einfangverhältnis (normal)	1,2 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	75 dB
ZF-Dämpfung bei 98 MHz	90 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	100 dB
AM-Unterdrückung	55 dB
Übersprechdämpfung (normal)	
1 kHz	45 dB
10 kHz	35 dB
Trägerrest	
19 kHz	−30 dB (−38 dB nach IHF)
38 kHz	−50 dB (−50 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,5 dB
Begrenzereinsatz	1,2 μV
Bandbreite (normal)	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	300 Ω (symmetrisch) 75 Ω (unsymmetrisch)

■ AM-TUNERTEIL

Wellenbereiche	522 ~ 1611 kHz (9 kHz step) 530 ~ 1620 kHz (10 kHz step)
Eingangsempfindlichkeit (S/R 20 dB)	30 μV, 250 μV/m
Trennschärfe	55 dB
Spiegelfrequenz-Dämpfung bei 999 kHz	50 dB
ZF-Dämpfung bei 999 kHz	40 dB

■ ALLGEMEINE DATEN

Leistungsaufnahme	530 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (B×H×T)	430 × 97 × 382 mm
Gewicht	10,1 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

■ CARACTERISTIQUES TECHNIQUES (DIN 45 500)

(Sujet á changement sans préaris.)

■ SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz,	
les deux canaux en circuit	2 × 55W (4Ω) 2 × 50W (8Ω)
Puissance de sortie continue de 40 Hz~16 kHz,	
les deux canaux en circuit	2 × 55W (4Ω) 2 × 50W (8Ω)
Puissance de sortie continue à 1 kHz	
les deux canaux en circuit	2 × 65W (4Ω) 2 × 55W (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,04% (4Ω) 0,02% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,04% (4Ω) 0,02% (8Ω)
à puissance nominale (1 kHz)	0,02% (4Ω) 0,02% (8Ω)
à demi-puissance (20 Hz~20 kHz)	0,015% (8Ω)
à demi-puissance (1 kHz)	0,005% (8Ω)
puissance de −26 dB à 1 kHz	0,1% (4Ω)
puissance de 50 mW à 1 kHz	0,12% (4Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω	0,04%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,02%
Réponse de fréquences	
les deux canaux en circuit, −3 dB	5 Hz~35 kHz (4Ω) 5 Hz~40 kHz (8Ω)
Bruit et ronflement résiduels	0,5 mV
Coefficient d'amortissement	15 (4Ω), 30 (8Ω)
Sensibilité et impédance d'entrée	
PHONO	2,5 mV/47kΩ
AUX (AUX)	150 mV/27kΩ
BANDE 2 (TAPE 2)	150 mV/27kΩ
BANDE 1, ENREGISTREMENT/LECTURE (TAPE 1 REC/PLAY)	180 mV/33kΩ
PHONO (tension d'entrée maximum, 1 kHz RMS)	150 mV
Signal/Bruit	
à puissance nominale (4Ω)	
PHONO	73 dB (80 dB, IHF '66, 8Ω)
AUX, BANDE (AUX, TAPE)	88 dB (98 dB, IHF '66, 8Ω)
puissance de −26 dB (4Ω)	
PHONO	64 dB
AUX, BANDE (AUX, TAPE)	66 dB
puissance de 50 mW (4Ω)	
PHONO	60 dB
AUX, BANDE (AUX, TAPE)	60 dB
Réponse de fréquence	
PHONO	Courbe nominale RIAA ±0,3 dB (30 Hz~15 kHz)
AUX, BANDE (AUX, TAPE)	5 Hz~70 kHz (−3 dB) ±0,5 dB (20 Hz~20 kHz)
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB~ −10 dB
AIGUS (TREBLE)	10 kHz, +10 dB~ −10 dB
Filtre subsonique	30 Hz, −6 dB/oct.
Filtre coupe-hauts	7 kHz, −6 dB/oct.
Compensateur physiologique (volume à −30 dB)	50 Hz, +9 dB
Réglage silencieux	−20 dB

Tension de sortie	
SORTIE ENREGISTREMENT BANDE 1, 2 (TAPE 1, 2 REC OUT)	150 mV
ENREGISTREMENT/LECTURE BANDE 1 (TAPE 1 REC/PLAY)	30 mV/82kΩ
Equilibrage des canaux, AUX 250 Hz~6 300 Hz	±1,0 dB
Séparation des canaux, AUX 1 kHz	55 dB
Niveau de sortie des casques et impédance	470 mV/330Ω
Impédance de charge	
PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)	4Ω~16Ω
PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)	8Ω~16Ω

■ SECTION SYNTONISATEUR FM

Gamme de fréquence	87,50~108,00 MHz (50 kHz step) 87,9~107,9 MHz (200 kHz step)
Sensibilité	
S/B 30 dB	1,9 μV (300Ω), 1,3 μV (75Ω)
S/B 26 dB	1,7 μV (300Ω), 1,2 μV (75Ω)
S/B 20 dB	1,5 μV (300Ω), 0,9 μV (75Ω)
Sensibilité utilisable IHF	1,9 μV (IHF '58)
Sensibilité stéréo au seuil de 46 dB, IHF	22 μV/75Ω
Distorsion harmonique totale (normal)	
MONO	0,1%
STEREO	0,3%
Signal/Bruit	
MONO	68 dB (74 dB, IHF)
STEREO	64 dB (68 dB, IHF)
Réponse de fréquence	20 Hz~15 kHz, +1 dB~ −2 dB
Sélectivité alternée par canal	
Normal, ±400 kHz	75 dB
Etroite, ±300 kHz	75 dB
Taux de capture (normal)	1,2 dB
Rejection d'image à 98 MHz	75 dB
Rejection FI à 98 MHz	90 dB
Rejection de réponse parasite à 98 MHz	100 dB
Suppression AM	55 dB
Séparation stéréophonique (normal)	
1 kHz	45 dB
10 kHz	35 dB
Fuite de porteuse	
19 kHz	−30 dB (−38 dB, IHF)
38 kHz	−50 dB (−50 dB, IHF)
Equilibrage de canaux (250 Hz~6,300 Hz)	±1,5 dB
Point de limite	1,2 μV
Largeur de bande (normal)	
Amplificateur FI	180 kHz
Démodulateur FM	1000 kHz
Bornes d'antenne	300Ω (symétrique) 75Ω (asymétrique)

■ SECTION SYNTONISATEUR AM

Gamme de fréquence	522~1611 kHz (9 kHz step) 530~1620 kHz (10 kHz step)
Sensibilité (S/B 20 dB)	30 μV, 250 μV/m
Sélectivité	55 dB
Réjection d'image à 999 kHz	50 dB
Réjection FI à 999 kHz	40 dB

■ DIVERS

Consommation	530W
Alimentation	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	430 × 97 × 382 mm
Poids	10,1 kg

Remarque:
On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Système H.P. 3045).

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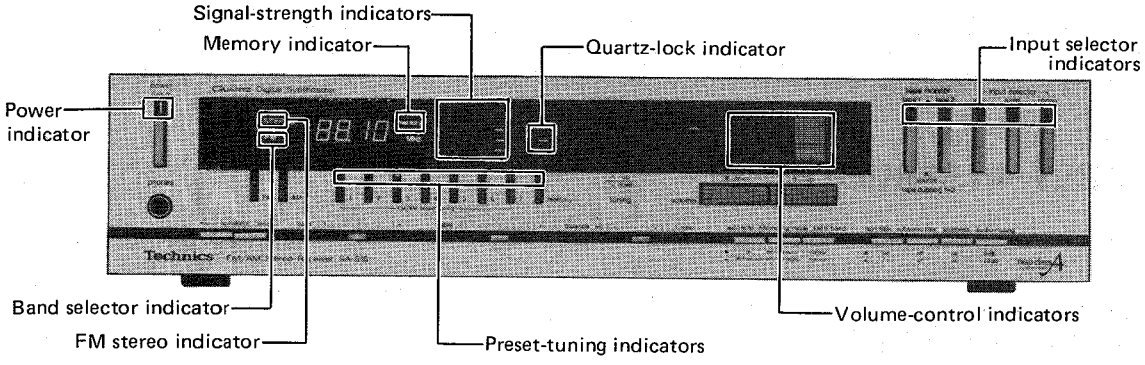
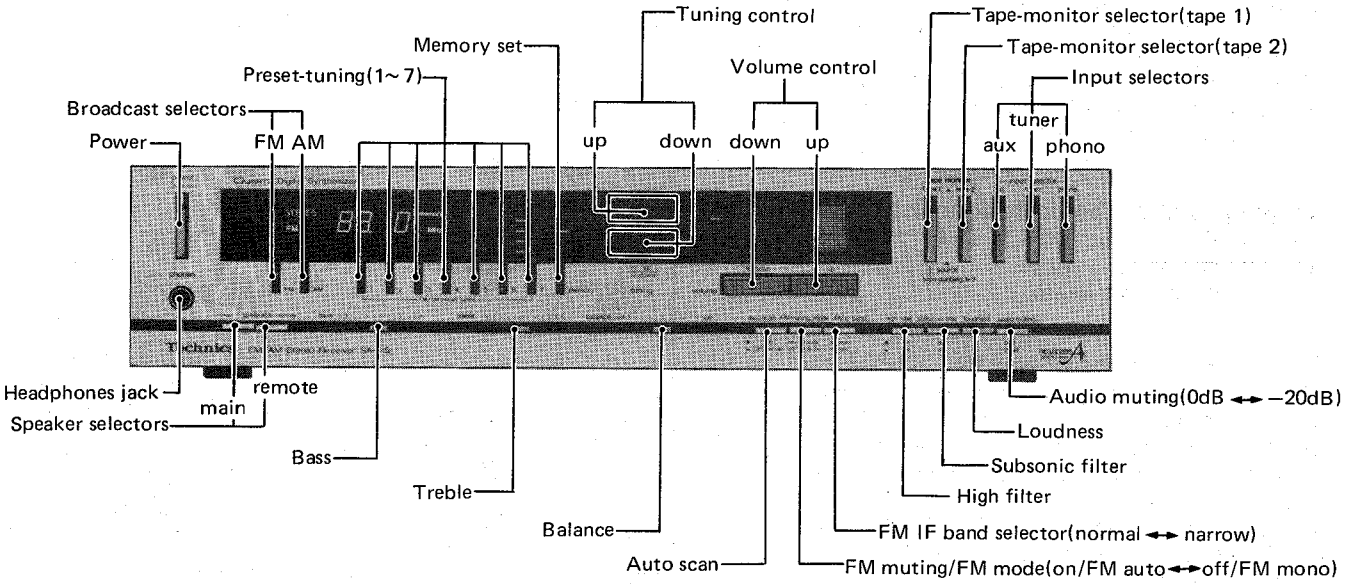
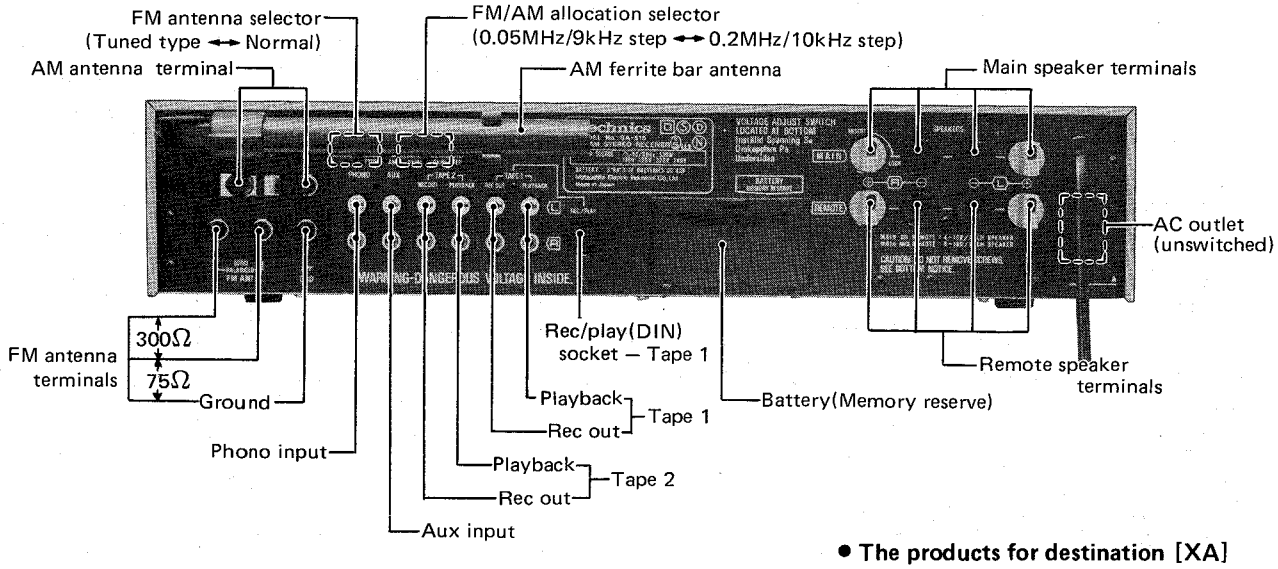
■ LOCATION OF CONTROLS







● The products for destination [XA] is equipped with AC outlet.

■ BEFORE STARTING THE REPAIRING

Before adjusting or repairing, be sure to short-circuit opposite poles of the 8200μF capacitors (C703 and C704) with a resistor approximately of "50Ω, 5W" for discharging the charged voltage.
Short-circuiting with a screw driver and the like is not only dangerous, but may destroy transistors and diodes, and should therefore be avoided.

■ DISASSEMBLY INSTRUCTIONS

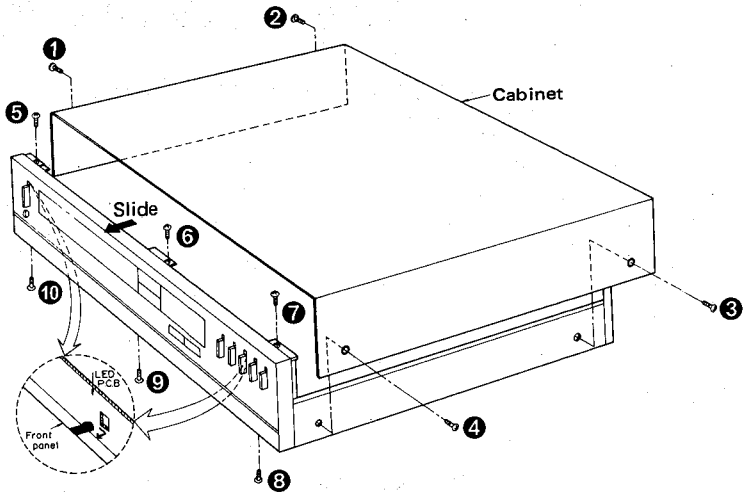


Fig. 1

• How to remove the cabinet

1. Remove the 4 setscrews (Fig. 1: ❶ ~ ❹) of the cabinet.
2. Remove the cabinet.

• How to remove the front panel

1. Remove the 6 setscrews (Fig. 1: ❺ ~ ❿) of the front panel.
2. Slide the front panel in the direction of the arrow in Fig. 1 to detach the panel from the chassis.
3. As shown in Fig. 1, remove the 3 lugs to detach the LED indicator printed circuit boards from the back of the front panel.

• How to remove the bottom board

1. Remove the 14 setscrews (Fig. 2: ⓫ ~ ㉔) of the bottom board.
2. Remove the bottom baord.

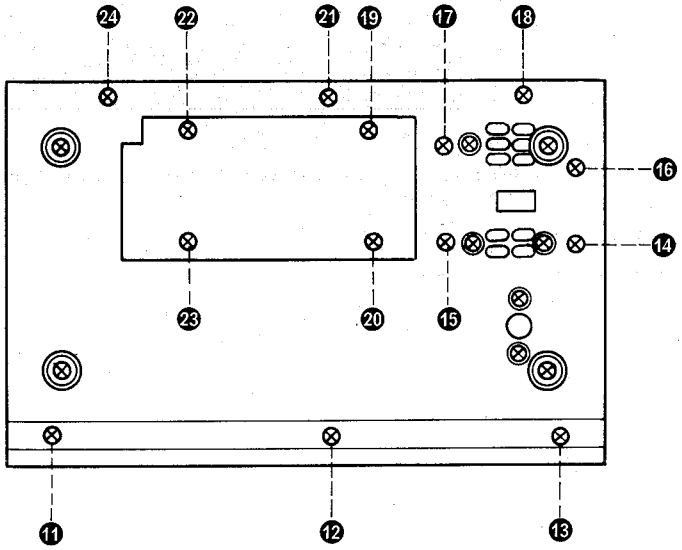


Fig. 2

• How to remove the power IC

1. Remove the cabinet and bottom board. (Refer to the sections "How to remove the cabinet" and "How to remove the bottom board").
2. Unsolder of power IC for left channel or right channel. (Fig. 3)
3. Remove the 2 setscrews (Fig. 3: ㉕ ~ ㉖ (left) or ㉗ and ㉘ (right)) of the chassis.
4. Remove the heat-sink.
5. Remove the 2 setscrews (Fig. 4: ㉙) of the heat-sink.

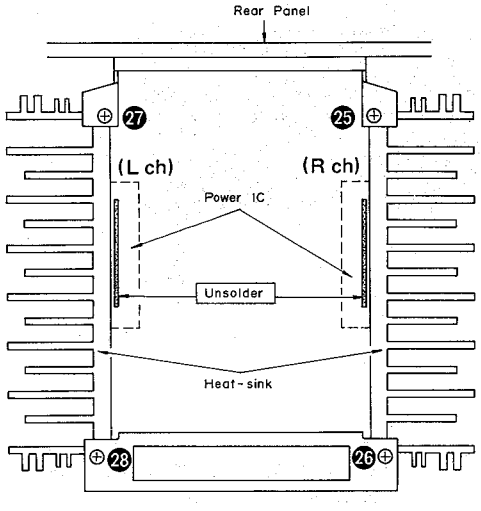


Fig. 3

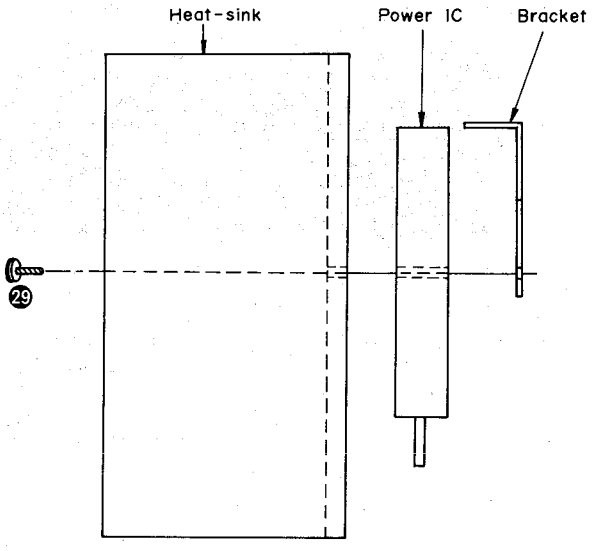


Fig. 4

• How to remove the motor (volume level control)

1. Remove the cabinet. (Refer to the section "How to remove the cabinet").
2. Remove the 2 setscrews (Photo 1: ㉚ ~ ㉛) and 6 connectors (Photo 1: ㉜ ~ ㊲) of the equalizer printed circuit board.
3. Remove the 2 setscrews (Photo 1: ㊳ and ㊴) of the chassis.
4. Remove the equalizer printed circuit board in the direction of the arrow in Photo. 1.
5. Remove the 2 setscrews (Fig. 5: ㊵ and ㊶) of the film bracket.
6. Slide the film bracker in the direction of the arrow in Fig. 5.

Note
How to remove the volume indicator lamp
This lamp can be removed by pressing and turning counterclockwise.

7. Slide the volume gear in the direction of the arrow in Fig. 6 to detach the volume gear from the motor assy.
8. Remove the 1 nut (Fig. 6: ㊷) of the volume control.
9. Unsolder of volume motor (Fig. 7: Ⓐ ~ Ⓓ).
10. Remove the volume motor in the direction of the arrow in Fig. 7.

Notes
How to install the volume film
1. Fully turn the volume gear clockwise, which is attached to the volume.
2. Wind the volume film around the volume gear and pulley (see Fig. 5 and Fig. 6), then secure it with the film fixing plate.
   In this case, the volume film should be positioned so that the initial hole of the film is engaged with the gear. (Refer to Fig. 5)

• How to check the tone control printed circuit board

1. Remove the cabinet, bottom board and front panel. (Refer to the section "How to remove the cabinet", "How to remove the buttom board" and "How to remove the front panel).
2. Remove the 2 screws (Photo 1: ㉚ and ㉛) and 6 connectors (Photo 1: ㉜ ~ ㊲) of the equalizer printed circuit board.
3. Remove the 2 screws (Photo 1: ㊳ and ㊴) of the chassis.
4. Remove the equalizer printed circuit board in the direction of the arrow in Photo 1.
5. Remove the 2 screws (Photo 2: ㊸ and ㊹) of the fluorescent display tube ornament.
6. Remove the 3 screws (Photo 3: ㊺ ~ ㊼) and 4 screws (Photo 1: ㊽ and ㊶) of the logic printed circuit board.
7. Remove the 2 connectors (Photo 1: ㊷ and ㊸) of the logic printed circuit board, and then lift the circuit board in the direction of the arrow in Photo 1.
8. Remove the 4 screws (Photo 4: ㊹ ~ ㊼) of the shield plate.
9. Remove the shield plate.

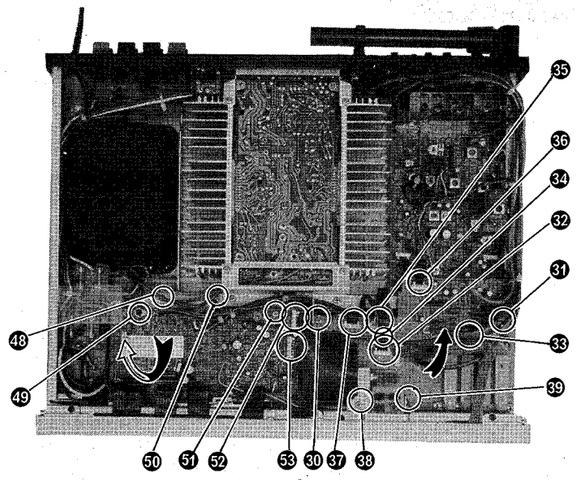


Photo 1

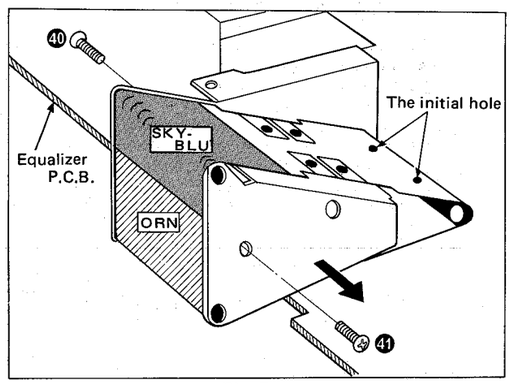


Fig. 5

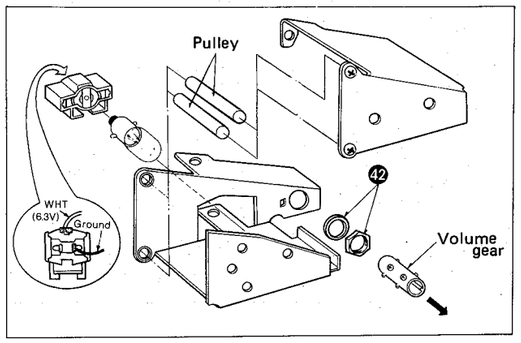


Fig. 6

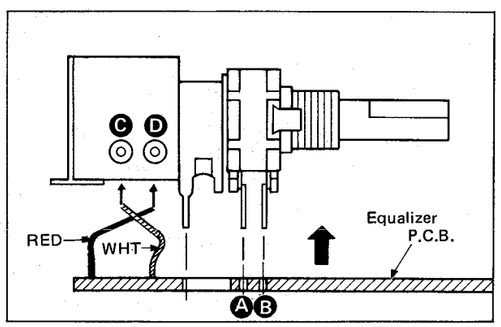


Fig. 7

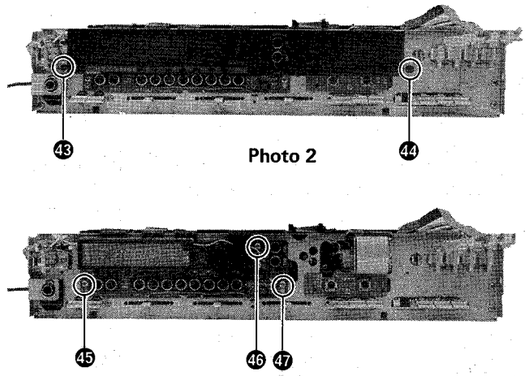


Photo 2 Photo 3

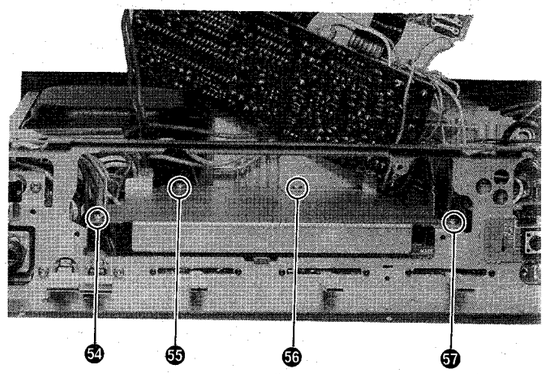


Photo 4

• Lead connector

1. To disconnect the lead wires from the lead connector, open the "lead holder" of the connector as shown in Fig. 8, and pull out the lead wires.
2. The lead wires are provided with identification colors or patterns as in Fig. 8. So, insert them into the connector in correct positions.
3. It is advisable to put pencil marks on both the leads and the connector beforehand for the convenience of insertion.

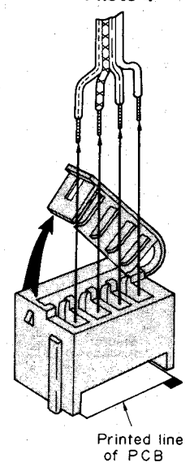
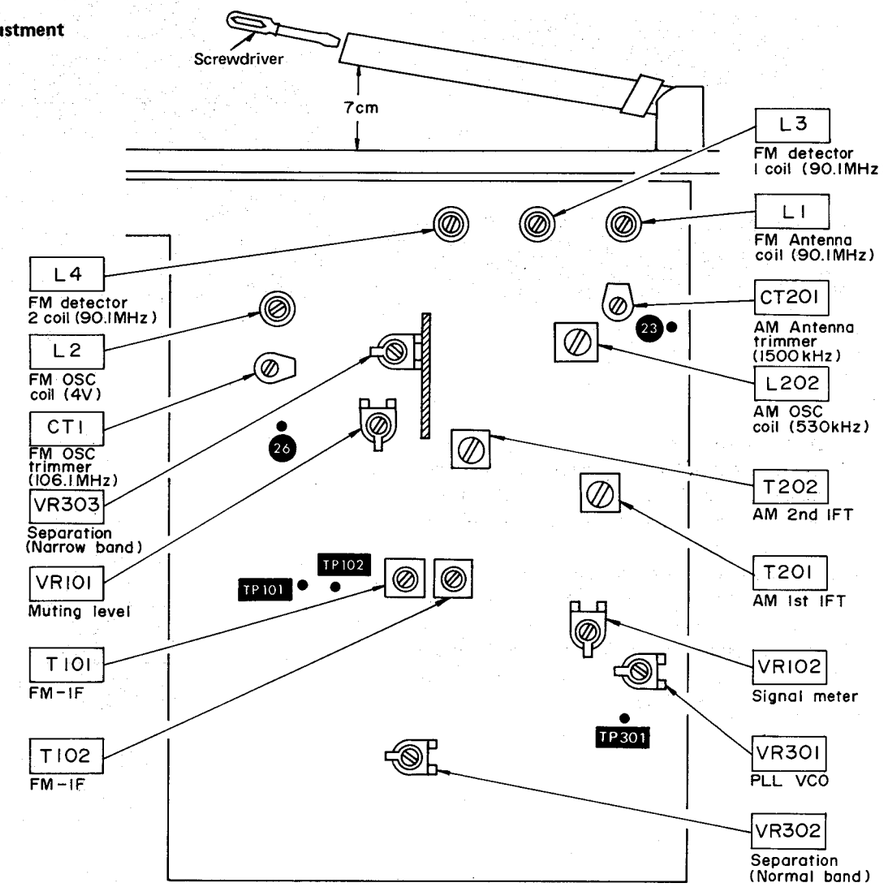


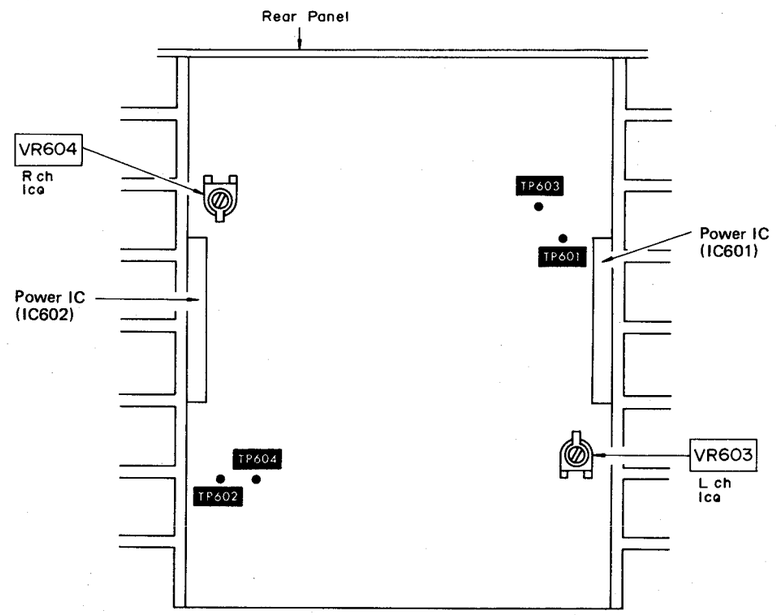
Fig. 8

■ ADJUSTMENT POINTS

● **Tuner adjustment**



● **Amplifier adjustment**



■ ADJUSTING INSTRUCTIONS ——— ENGLISH

AMPLIFIER ADJUSTMENT

● **Setting of controls and instruments to be used**

1. Speaker switch . . . . . .Main
2. Sound volume . . . . . .0 (minimum)
3. DC voltmeter (capable to reasure 5mV)

* Before the adjustment, VR603 and VR604 should be turned to counter-clockwise direction.

No.	ADJUSTMENTS	DC VOLTMETER CONNECTION	PARTS ADJUSTED	ADJUSTING PROCEDURE
1	Icq	(L channel) Between TP601 and TP603 (minus probe) (R channel) Between TP602 and TP604 (minus probe)	VR603 (L channel) VR604 (R channel)	* Adjust VR603 (L ch) and VR604 (R ch) to approx. 6mV after ten minutes warm-up time.

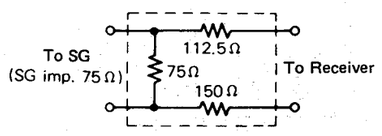
* Set FM/AM allocation selector to "FM 0.2MHz/AM 10kHz" position.
* Set antenna selector to "normal" position.

AM TUNER ADJUSTMENT

*** Setting and Equipment used**

1. AC and DC electronic voltmeters (VTVM)
2. AM signal generator (AM-SG)
3. Maintain line voltage at rated voltage.
4. Output of signal generator should be no higher than necessary to obtain an output reading.
5. Adjust the antenna coil (L201) position by using a screwdriver so that it is at approximately 7cm degrees to the rear panel.
6. Set input selector to "tuner" position.
7. Use a non-metal screwdriver for the adjustment.
8. Set FM muting/mode switch to "off/FM mono" position.
9. Set broadcast selector to "AM"position.
10. Set speaker selector to "main" position.

Step No.	AM SIGNAL GENERATOR CONNECTION	AM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	AM-IF ADJUSTMENT					
1	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Powerful input)	450kHz (30% Mod. with 400Hz)	Frequency of non-inter-ference	Connect AC VTVM or scope to "Speaker" terminals of the set.	T201 (1st IFT) T202 (2nd IFT)	* Adjust the input frequency and adjustment points so that the output becomes maximum.
	AM-RF ADJUSTMENT					
2	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	530kHz (30% Mod. with 400Hz)	530kHz	Connect DC VTVM to (23) terminal.	L202 (OSC Coil)	Adjust L202 to 1.1V ± 0.05V.
3		610kHz (30% Mod. with 400Hz)	610kHz	Connect AC VTVM to scope to "Speaker" terminals of the set.	L201 (ANT Coil)	1. Adjust for maximum output. 2. Adjust ferrite core of L201 by screwdriver.
4		1500kHz (30% Mod. with 400Hz)	1500kHz	Connect AC VTVM to scope to "Speaker" terminals of the set.	CT201(ANT Trimmer)	1. Adjust for maximum output. 2. Repeat steps (3) and (4) until the frequency correctly matches the dial display.



300Ω FM dummy antenna

Fig. 9 (Abb. 9)

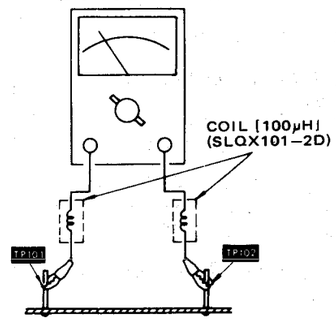
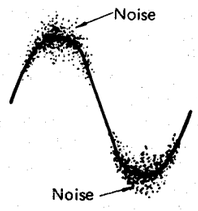


Fig. 10 (Abb. 10)



AF output wave form

Fig. 11 (Abb. 11)

FM TUNER ADJUSTMENT

*** Equipment used**
1. FM signal generator (FM-SG)
2. Stereo modulator
3. Distortion analyser
4. Oscilloscope
5. AC and DC electronic voltmeters (VTVM).
6. Frequency counter (19kHz and 108MHz measurable).
7. FM 300Ω dummy antenna (Fig. 9).

*** Preparation of FM signal generator (FM-SG)**
1. Connect stereo modulator to FM-SG.
2. Apply SG output to antenna terminal of the set through 300Ω FM dummy antenna.
3. The standard input of the set is 60dB (1mV), 400Hz 100% modulation (Because of using dummy antenna, SG output must be 12dB plus (IHF). That is, when input is 60dB, SG output is to be 72dB).

*** Setting**
1. Set IF band selector to "normal" position.
2. Set broadcast selector to "FM" position.
3. Other setting are the same as in AM adjustment.

Step No.	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	INDICATOR	ADJUSTMENT POINTS	REMARKS
	FM-IF ADJUSTMENT					
5	–	No-Signal	Frequency of non-interference	Connect DC VTVM between TP101 and TP102 through choke coil. (Refer to Fig. 10)	T101 (Discri. IFT)	Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.
	FM RF ADJUSTMENT					
6	–	No-Signal	87.9MHz	Connect DC VTVM to ㉖ terminal.	L2 (OSC Coil)	Adjust L2 (OSC Coil) to 4.0V.
7	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna.	90.1MHz (100% Mod. with 400Hz) weak input	90.1MHz	Connect scope to "Speaker" terminals of the set.	L3 (RF DET Coil 1st) L4 (RF DET Coil, 2nd) L1 (ANT Coil) T1 (FM IFT)	1. Add weak input so that noise is included in the output wave form. 2. Make the adjustment so that the output wave form is vertically symmetrical. (Refer to Fig. 11.) 3. Repeat the steps (7) and (8) until the frequency correctly matches the broadcasts frequency display.
8		106.1MHz (100% Mod. with 400Hz)	106.1MHz	Connect scope to "Speaker" terminals of the set.	CT1 (OSC Trimmer)	
	FM MONO DISTORTION ADJUSTMENT					
9	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 60dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect distortion analyser to "Speaker" terminals of the set.	T101, T102 (Discri. IFT)	1. Set the FM muting/FM mode switch to "on/auto" and then check step (5) in no signal mode. 2. If it is deflected, readjust of T101. 3. Adjust T102 core so that distortion of right and left channels are minimized.
	FM MUTING LEVEL ADJUSTMENT					
10	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna. (Apply 12dB [product for [XA] only 10dB] to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect AC VTVM or scope to "Speaker" terminals of the set.	VR101(Muting level)	1. Set the FM muting/FM mode switch to "off/mono". 2. With the FM muting/FM mode switch set to "on/auto", adjust VR101 so that the output is given with muting condition released.
	SIGNAL METER LED (Light Emitting diode) INDICATOR ADJUSTMENT					
11	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antanna. (Apply 45dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Signal meter LED	VR102 (Meter level)	Adjust VR102 while observing the signal meter LED so that the indicator at 5th is about to turn on.
	FM MPX PILOT (VCO) ADJUSTMENT					
12	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna. (Monaural signal)	100.1MHz (Non-modulated)	100.1MHz	Connect frequency counter to TP301 terminal.	VR301 (VCO)	1. Set the FM muting/FM mode switch to "on/auto". 2. Adjust VR301 to 19kHz ± 30Hz.

Step No.	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	INDICATOR	ADJUSTMENT POINTS	REMARKS
	SEPARATION ADJUSTMENT (Normal IF band)					
13	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 1kHz) (L or R mode)	100.1MHz	Connect AC VTVM to "Speaker" terminals of the set.	VR302 (Normal IF separation)	1. Set the IF band selector to "normal". 2. Set the FM muting/FM mode switch to "on/auto". 3. Adjust VR301 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.
	SEPARATION ADJUSTMENT (Narrow IF band)					
14	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 1kHz) (L or R mode)	100.1MHz	Connect AC VTVM to "Speaker" terminals of the set.	VR303 (Narrow IF separation)	1. Set the IF band selector to "narrow". 2. Set the FM muting/FM mode switch to "on/auto". 3. Adjust VR303 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.

■ EINSTELLUNGSANWEISUNGEN — DEUTSCH

ICQ-EINSTELLUNG

- Vor der Abstimmung VR603 und VR604 bis zum Anschlag entgegen dem Uhrzeigersinn drehen.
- Einstellung der zu benutzenden Regler und Instrumente
  1. Lautsprecherschalter . . . . . Hauptlautsprecher (main).
  2. Lautstärke . . . . . "0" (Minimalstellung).
  3. Gleichstromvoltmeter . . . . . 5mV Meßbereich erforderlich.

Nr.	Einstellungen	Gleichstromvoltmeter-verbindungen	Einstellungspunkte	Einstellungsvorgang
1	ICQ	L-Kanal. Zwischen TP601 und TP603 (Minustest) R-Kanal. Zwischen TP602 und TP604 (Minustest)	VR603 (L-Kanal) VR604 (R-Kanal)	*VR603 (L-Kanal) und VR604 (R-Kanal) auf ungefähr 6mV, nach 10 Minuten Anwärmezeit, einstellen.

- FM/AM Wellenverteilungs-Wahlschalter auf Position "FM 0.2MHz/AM 10kHz stellen.

AM (MW)-EINSTELLUNG

- **Stellungen und zu benutzende Geräte**
1. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM)
2. AM (MW)-Meßsender (AM-SG)
3. Netzspannung auf ihren Sollwerthalten.
4. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
5. Nittels eines Schraubenziehers die Stellung der Antennenspule (L201) so einstellen, daß, sie gegen die Rückenplatte einen Winkel von ca. 7cm macht.
6. Den Eingangswähler auf die "tuner"-Position stellen.
7. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.
8. FM Muting/Mode Schalter ... off/mono
9. Bereichsschalter ... AM
10. Lautssprecherschalter ... main

Nr.	AM (MW)-MESSENDER ANSCHLUSS	AM (MW)-MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	AM(MW)-ZF-ABGLEICH					
1	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Anten-neneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)	450kHz (400Hz Modulat., 30%)	Kein Empfang	Oszilloskop oder Wech-selstrom-Voltmeter über den Lautsprecher schließen.	T201 (1. IFT) T202 (2. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adustie-ren, daß der Ausgang den maximalen Wert erreicht.

	AM (MW)-MESSENDER		ANZEIGE FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	ANSCHLUSS	FREQUENZ				
	AM(MW)-HF-ABGLEICH					
2	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	530kHz (400Hz Modulat., 30%)	530kHz	Zwischen ㉓ und Erdung Gleichstrom-Voltmeter schließen.	L202 (Osc. Spule)	L202 so justieren, daß die vom Gleichstrom-Voltmeter gemessene. (1.1V±0.05V)
3		610kHz (400Hz Modulat., 30%)	610kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	L201 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von L201 mit einem Schraubendreher justieren.
4		1500kHz (400Hz Modulat., 30%)	1500kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	CT201 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (3) und (4) wiederholen, bis die Frequenz genau mit der Skalenanzeige übereinstimmt.

FM (UKW)-EINSTELLUNG

- **Verwendete Einrichtungen**
1. UKW-Meßsender (FM-SG)
2. Stereo-Modulator (oder Trennmesser)
3. Verzerrungsmesser
4. Oszilloskop
5. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM)
6. Signalfrequenzmesser (meßbar für 19kHz und 108MHz)
7. UKW 300-Ohm Kunstantenne (Abb. 9)

- **Zustand des Gerätes**
1. Den UKW-Antennenwahlschalter auf die "normal"-Stellung bringen.

- **Vorbereitung AM UKW-Messender (FM-SG)**
1. Stereo-Modulator an FM-SG anschließen.
2. SG-Ausgang über 300-Ohm UKW Kunstantenne an den Antenneneingang des Gerätes schließen.
3. Der normale Eingang des Gerätes beträt 60dB (1mV), 400Hz 100% Modulation. (Wegen Verwendung der Kunstantenne muß der Signalausgang 12dB plus (IHF) sein: d.h. beim Eingang von 60dB soll der Signalausgang 72dB sein.)
2. Den Eingangswähler auf die "FM"-Position stellen.
3. Die anderen Einstellungen entsprechen den AM (MW)-Einstellungen.

	FM (UKW) MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	ANSCHLUSS	FREQUENZ				
	UKW-ZF-ABGLEICH					
5	–	Kein Signal	Kein Empfang	Ein Gleichstromröhren-voltmeter zwischen TP101 und TP102 über eine Drosselspule verbinden. (Siehe Abb. 10)	T101 (Diskriminator FT)	Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt.
	UKW-HF-ABGLEICH					
6	–	Kein Signal	87.9MHz	Zwischen ㉖ und Erdung Gleichstrom-Voltmeter schließen.	L2 (Osc. Spule)	L2 so justieren, daß die vom Gleichstrom-Voltmeter gemessene Spannung 4.0V beträgt.
7	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	90.1MHz (400Hz Modulat., 100%)	90.1MHz	Oszilloskop über den Lautsprecher schließen.	L3 (HF Det. Spule 1) L4 (HF Det. Spule 2) L1 (Ant. Spule)	1. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 11) 3. Die Einstellung von (7) und (8) wiederhoten, bis die Frequenz mit der Skala übereinstimmt.
8		106.1MHz (400Hz Modulat., 100%)	106.1MHz	Oszilloskop über den Lautsprecher schließen.	CT1 (Osc. Trimmer)	
	ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO					
9	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen	100.1MHz (400Hz Modulat., 100%)	100.1MHz	Klirrfaktor-Meßbrücke über den Lautsprecher schließen.	T101, T102 (Diskriminator FT)	1. Den UKW Muting/UKW-Betriebsartschalter auf "on/auto" einstellen und dann Schritt (5) im signallosen Zustand prüfen. 2. Wenn Abweichung vorliegt (primäre Seite) von T101 wieder einstellen. 3. T102 Kern für minimale Verzerrung der rechten und linken Kanäle justieren.

	FM (UKW) MESSENDER		ANZEIGE FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	ANSCHLUSS	FREQUENZ				
	UKW-STUMMABSTIMMUNGS PEGELANZEIGER					
10	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (12dB in den Antenneneingang leiten.)	100.1MHz (400Hz Modulat., 100%)	100.1MHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	VR101 (UKW-Muting)	1. Den UKW Muting/UKW-Betriebsartschalter auf "off/mono" einstellen. 2. "Muting" Schalter auf "on" stellen. VR101 so einstellen, daß der Ausgang unter Bewirken der Dämpfung gegeben wird.
	ABGLEICHEN DES SIGNALMETER-LED (LICHTERZEUGENDE DIODE) – ANZEIGERS					
11	Meßsender über eine Kunstantenne an den UKW-Antenneneinschließen. Meßsender auf 45dB einstellen.	100.1MHz (400Hz Modulat., 100%)	100.1MHz	Signalmeter-LED	VR102 (Metervolumen)	Unter Beobachtung der Signalmeter-LED VR201 so justieren, daß der Anzeiger am 5. fast aufzuleuchten beginnt.
	UKW-MPX-PILOTABGLEICH (VCO)					
12	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Mono-Signal)	100.1MHz (Unmodulierte Welle)	100.1MHz	Signal frequenzmesser an TP301 schließen.	VR301 (VCO)	1. Den UKW Muting/UKW-Betriebsartschalter auf "on/auto" einstellen. 2. VR301 so abgleichen, daß Ausgangsfrequenz von TP301 19kHz±30Hz
	TRENNUNG-ABGLEICH (Normal IF band)					
13	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400Hz Modulat., 100%) L- oder R-Betriebsart)	100.1MHz	Wechselstrom-Voltmeter über den Lautsprecher schließen.	VR302 (Normal IF Separation)	1. FM-ZF-Bandbreitenschalter ... normal 2. Den UKW Muting/UKW-Betriebsartschalter auf "on/auto" einstellen. 3. VR302 auf minimale Anzeige des R-Ausgangs bei Stereomodulator in L-(L-Kanalmodulation) Modus, und auf minimale Anzeige des L-Ausgangs in R-Modus abgleichen.
	TRENNUNG-ABGLEICH (Narrow IF band)					
14	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400Hz Modulat., 100%) L- oder R-Betriebsart)	100.1MHz	Wechselstrom-Voltmeter über den Lautsprecher schließen.	VR303 (Narrow IF Separation)	1. FM-ZF-Bandbreitenschalter ... narrow 2. Den UKW Muting/UKW-Betriebsartschalter auf "on/auto" einstellen. 3. VR302 auf minimale Anzeige des R-Ausgangs bei Stereomodulator in L-(L-Kanalmodulation) Modus, und auf minimale Anzeige des L-Ausgangs in R-Modus abgleichen.

■ INSTRUCTIONS DE REGLAGE — FRANÇAIS

REGLAGE DE ICQ

- Avant la mise au point, VR603 et VR604 devront être tournés dans la direction on inverse des aiguilles d'une montre.
- Réglage des commandes et instruments à utiliser
  1. Commutateur du haut-par/eur . . . . . Principal
  2. Volume du son . . . . . 0 (minimum)
  3. Voltmètre CC (pouvant mesurer 5mV)

No.	Reglages	Connexions du voltmetre CC	Point de réglage	Procédé de réglage
1	ICQ	Canal G. Entre TP601 et TP603 (sonde au moins) Canal D. Entre TP602 et TP604 (sonde au moins)	VR603 (Canal G) VR604 (canal D)	Régle les VR603 (canal gauche) et VR604 (canl droit) sur env. 6mV aprés 10mn. de prèchaufftage.

• Régler le sélecteur d'attribution FM/AM sur la position "FM 0.2MHz/AM 10kHz".

REGLAGE DE AM

- **Réglage et équipement utilisé**
1. Voltmètres électronique de courant alternatif et de courant continu (VTVM)
2. Générateur du signal AM (AM-SG)
3. Conservel la tension du secteur à la tension nominale.
4. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.
5. Régler la position de la bobine (L201) de l'antenne en utilisant un tournevis de telle sorte qu'alle soit environ à 7cm de la plaque arriére.
6. Sélecteur d'entrée sur la position "tuner"
7. Utiliser un tournevis non-métallique pour le réglage.
8. Commutateur de silencieux/mode ... off/mono
9. Sélecteur de gamme ... AM
10. Commutateur du haut-parleur ... principal.

No.	AM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	BRANCHEMENT	FREQUENCE				
	REGLAGE DE FI-AM					
1	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée sous puissante)	450kHz (modulé à 30% par 400Hz)	Point sans signal	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	T201 (1 transfo F1) T202 (2 transfo F1)	Régler la fréquence d'entrée et les points de réglage de telle sorte que la sortie devienne maximale.
	REGLAGE DE RF-AM					
2	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	530kHz (modulé à 30% par 400Hz)	530kHz	Brancher le voltmètre à courant continu entre ㉓ et la prise de terre.	L202 (Bobine OSC)	Régler L202 de telle sorte que le voltage mesuré par le voltmètre à courant continu, soit de 1.1V ± 0.05V.
3		610kHz (modulé à 30% par 400Hz)	610kHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	L201 (Bobine Ant.)	1. Régler au maximum de signal de sortie. 2. Régler le noyau ferrite de L201 à l'aide d'un tournevis.
4		1500kHz (modulé à 30% par 400Hz)	1500kHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	CT201 (Trimmer Ant.)	1. Régler au maximum de signal de sortie. 2. Refaire les étapes (3) et (4) jusqu'à ce que le fréquence s'aligne correctement avec l'affichage du cadran.

REGLAGE DE FM

- **Equipment utilisé**
1. Générateur du signal FM (FM-SG)
2. Commande de réglage stéréophonique (ou vu-mètre de séparation).
3. Jauge de distorsion.
4. Oscilloscope.
5. Voltmètres électronique de courant alternatif et de courant continu (VTVM).
6. Compteur de fréquence (19kHz et 108MHz mesurable).
7. Antenne fictive FM, 300 ohms (Fig. 9)

- **Conditions de l'appareil**
1. Placer le sélecteur de l'antenne FM sur la position "normal".
2. Sélecteur d'entrée sur la position "FM".

- **Préparation du générateur de signal FM (FM-SG)**
1. Brancher la commande de réglage stéréophonique à FM-SG.
2. Alimenter la sortie SG à la borne de l'antenne de l'appareil, par l'antenne fictive FM, 300 ohms.
3. L'entrée standard de l'appareil est de 60dB (1mV), 400Hz, 100% de modulation (à cause de l'utilisation de l'antenne fictive, la sortie SG doit être de plus 12dB (IHF). Ce qui signifie que quand l'entrée est de 60dB, la sortie SG doit être de 72dB.)

3. Les autres réglages sont les mêmes que les réglages de AM.

No.	FM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	BRANCHEMENT	FREQUENCE				
	REGLAGE DE FI-FM					
5	–	Sans Signal	Point sans signal	Brancher le voltmètre électronique a.c.c. aux bornes TP101 et TP102. (Voir la Fig. 10)	T101 (Transfo FI discri.)	Régler le noyau T101 de telle sorte que le voltage mesuré dans le mode sans signal, soti de 0V dans la gamme des 300mV.
	REGLAGE DE RF-FM					
6	–	Sans Signal	87.9MHz	Brancher le voltmètre à courant continu entre ㉖ et la prise de terre.	L2 (Bobin Osc.)	Régler L2 de telle sorte que le voltage mesuré par le voltmètre à courant continu soit de 4.0V.

	FM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	BRANCHEMENT	FREQUENCE				
7	Branchez sur la prise d'antenne FM à traves une antenne fictive FM	90.1MHz (modulé à 100% par 400Hz)	90.1MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'amplituner.	L3 (1er détecteur) L4 (2e détecteur) L1 (Bobin Ant.)	1. Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. 2. Faire le réglage de telle sorte que la forme de l'onde de sortie soit verticalement symétrique. (Voir Fig. 11) 3. Refaire les réglages (7) et (8) jusqu'à ce que la fréquence corresponde correctement avec l'échells du cadran.
8		106.1MHz (modulé à 100% par 400Hz)	106.1MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'amplituner.	CT1 (Trimmer Osc.)	
	REGLAGE DE LA DISTORSION FM EN MONO					
9	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	100.1MHz (modulé à 100% par 400Hz)	100.1MHz	Branchez un distorsion métre sur les bornes de haut-parleur de l'appareil.	T101, T102 (Transfo FI discri.)	1. Placer la commutateur de réglage silencieùx de FM/ mode de FM sur la position "on/auto" et vérifier l'étape (5) dans le mode sans signal. 2. S'il est déplacé, re-fégler (côté primaire) de T101. 3. Régler le noyou T102 de telle sorte que la distorsion des canaux droit et gauche soit la plus faible.
	REGLAGE DU SEUIL DU SILENCIEUX D'ACCORD					
10	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Appliquer 12dB à la borne de l'antenne.)	100.1MHz (modulé à 100% par 400Hz)	100.1MHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'amplituner.	VR101	1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "off/mono". 2. Avec le commutateur de mode/réglage silencieux "on/auto", régler le VR101 de telle sorte que la sortie fournie avec le réglage silencieux en position déclenchée.
	ALIGNEMENT DE L'INDICATEUR DE SIGNAL DE LA DIODE A EMISSION DE LUMIERE (DEL)					
11	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. Niveau de sortie du générateur 45dB	100.1MHz (modulé à 100% par 400Hz)	100.1MHz	DEL du compteur à signal de l'aiguille du cadran.	VR102 (Registor variable du compteur)	Réglez VR102 en observant la DEL du compteur à signal afin que l'indicateur au 5 ème est à presque tourner.
	REGLAGE (VCO) PILOTE MULTIPLEX FM					
12	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal monoscoustique)	100.1MHz Non modulé	100.1MHz	Brancher le compteur de fréquence à TP301	VR301	1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 2. Régler VR301 de telle sorte que la fréquence de sortie de TP301 soit de 19kHz ±30Hz.
	REGLAGE DE LA SEPARATION DES CANAUX (Normal IF band)					
13	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (modulé à 100% par 400Hz) (Mode G ou D.)	100.1MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'amplituner.	VR302 (Normal IF Separation)	1. Interrupteur de gamme FM-IF ... normal. 2. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 3. Régler VR302 de telle sorte que la sortie droite soit minimale quand la commande d'accord stéréophonique est dans le mode gauche (modulation du canal gauche) et que la sortie gauche soit minimale dans mode droit.

	FM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	BRANCHEMENT	FREQUENCE				
	REGLAGE DE LA SEPARATION DES CANAUX (Narrow IF band)					
14	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (modulé à 100% par 400Hz) (Mode G ou D.)	100.1MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'amplituner.	VR303 (Narrow IF Separation)	1. Interrupteur de gamme FM-IF ... narrow. 2. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 3. Régler VR303 de telle sorte que la sortie droite soit minimale quand la commande d'accord stéréophonique est dans le mode gauche (modulation du canal gauche) et que la sortie gauche soit minimale dans mode droit.

■ HOW TO REPLACE CHIPS

(RESISTOR, CAPACITOR AND JUMPER)

1. Remove solder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in fig. 12.
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in fig. 13.

Notes:

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

Color	Original Parts Name
Black	Chip Resistor and Jumper
Brown, White or Green	Chip Capacitor

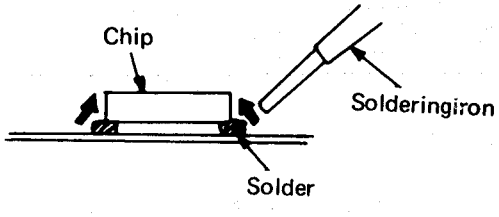


Fig. 13

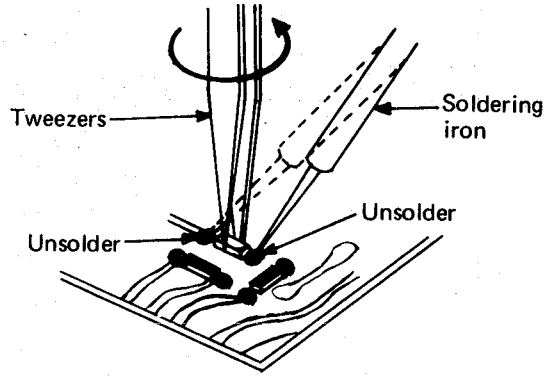


Fig. 12

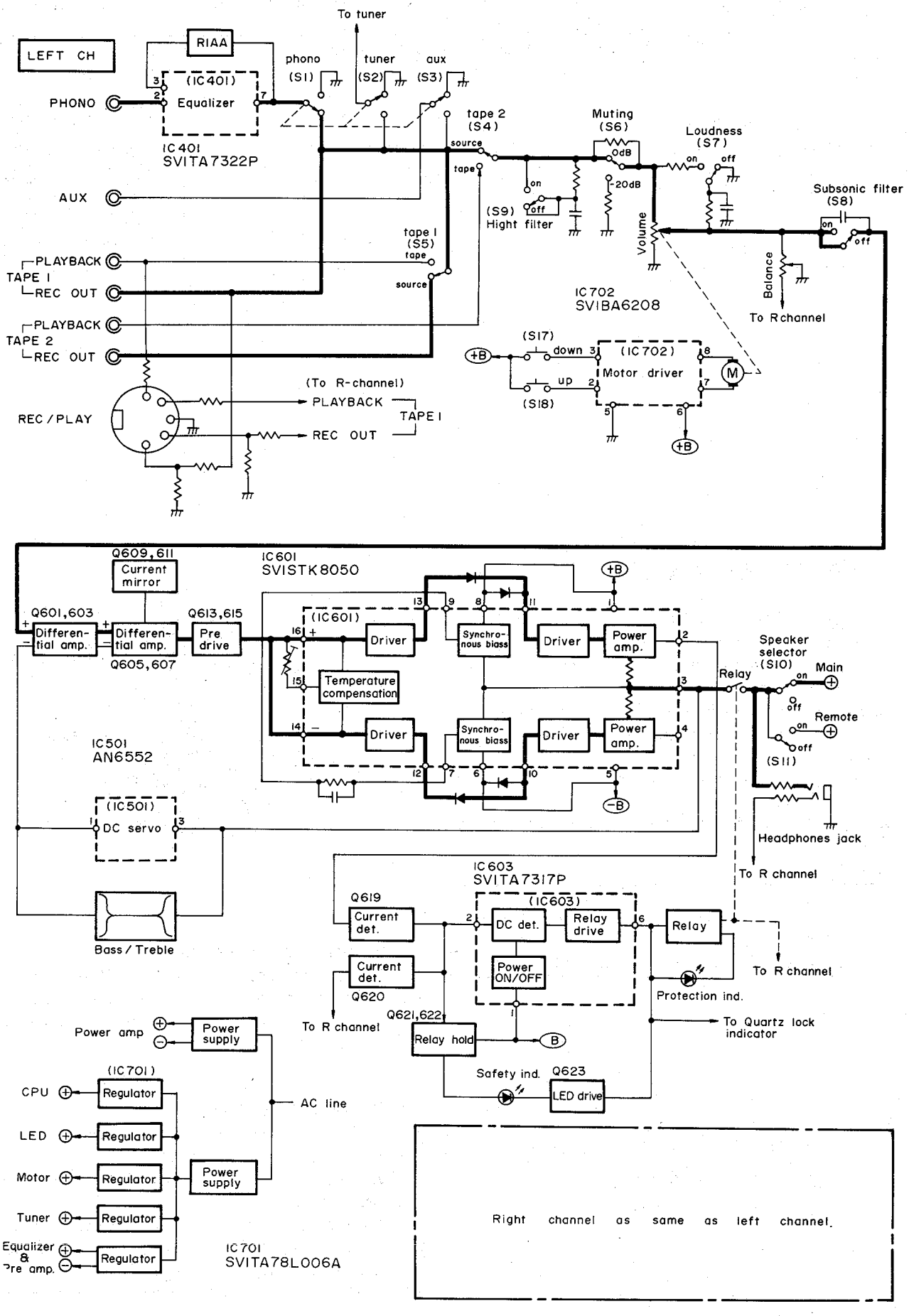
• Note for replacing chips

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.

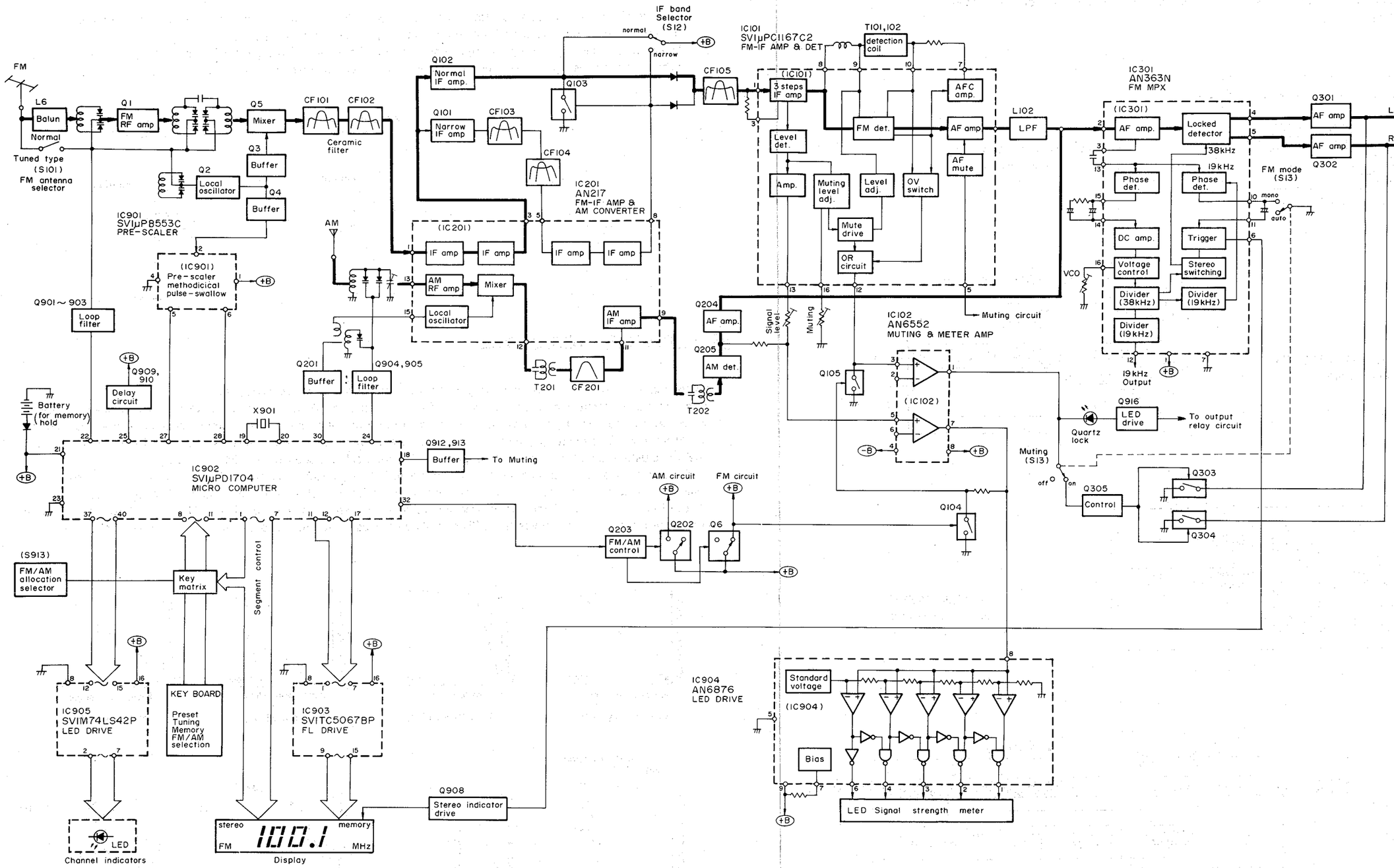
• Precautions for repair

When frequency is not indicated, FL (display tube), FL driver, digit circuit, and micro-computer must be checked by oscilloscope.
In this case, take care not to allow shortcircuit between IC terminals or application of voltage from measuring instrument to IC terminals.

■ BLOCK DIAGRAM (Amplifier and Tone control)

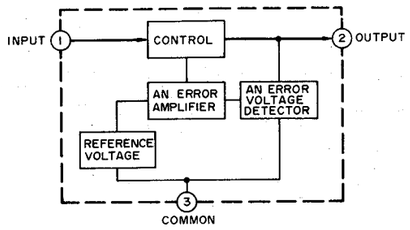


■ BLOCK DIAGRAM (Tuner and Display)



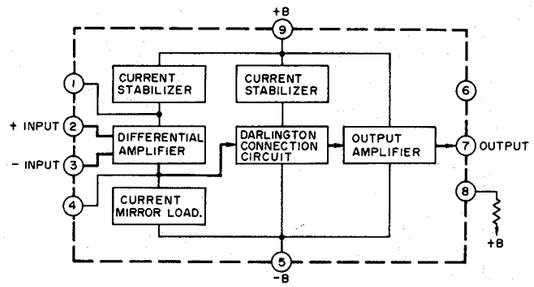
■ BLOCK DIAGRAM OF IC'S

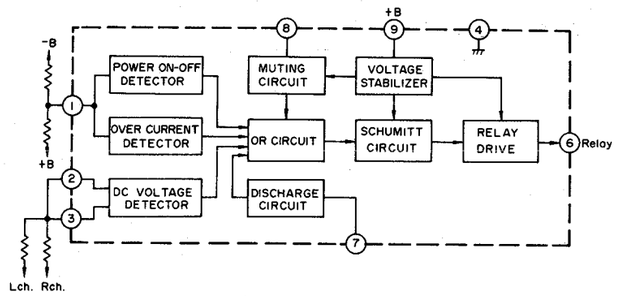
This is the basic block diagram of the inside circuit of IC. In an actual circuit, there may be sometimes idle terminals or some different functions other than the basic circuit.



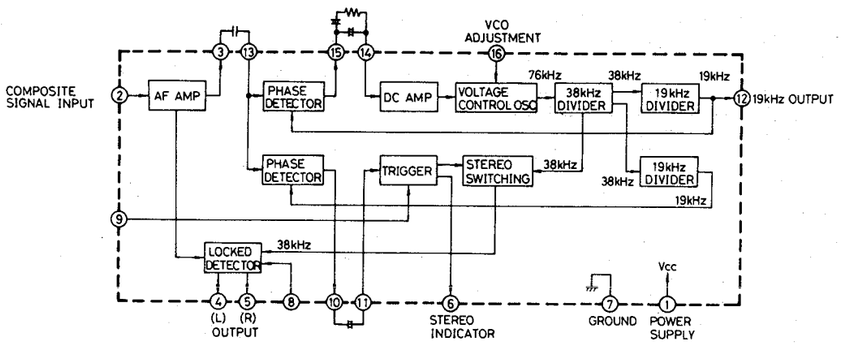
IC701 (SVITA78L006A)
Voltage regulator

IC401, 402 (SVITA7322P)
Equalizer amp.





IC603 (SVITA7317P)
Speakers protection



IC301 (AN363N)
FM Multiplex

■ VOLUME SWITCH (S17 and S18)

- **2-step tact switch**

The switch (volume up/down switch) used in the motor volume circuit of this unit is a 2-step tact switch.
This switch has a common terminals and terminals 1, 2, 3 as shown in Fig. 14.
When the switch is lightly pressed, the common terminal is connected to terminals 1 and 3 (Fig. 15).
When the switch is strongly pressed, the common terminal is connected to terminals 1, 2 and 3 (Fig. 16).

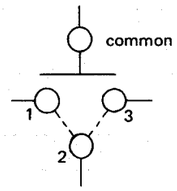


Fig. 14

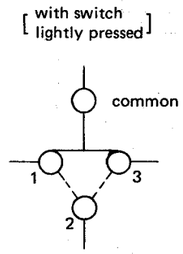


Fig. 15

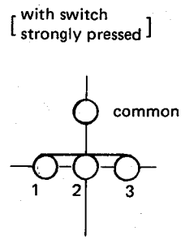
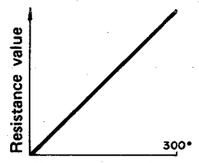


Fig. 16

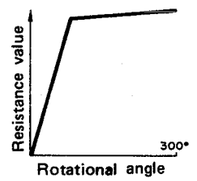
■ VARIABLE RESISTORS

- **Alteration of resistance values according to the rotational angles of variable resistors**

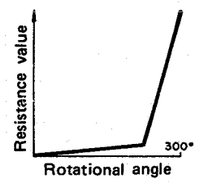
Alteration characteristics as shown below are often used for sets. All are intended to keep the frequency response of the set at optimum levels, and are used according to the types of circuits. For example, characteristic (B) is used for sound volume adjustment; (A) and (C) are for bass and treble sound quality adjustment; (G) is for medium sound quality adjustment; and (BH) is for the adjustment of sound balance between the right and left.
In the case of this unit, variable resistor with characteristic (C) which is short-circuited between its ends at rotational angle of 150° (center) is used for bass adjustment. Also, variable resistor with characteristic (C) whose resistance is zero at rotational angle of 150° (center) is used for treble adjustment. And characteristic (BH) in which two variable resistors are interlocked with characteristics (C) and (A) combined is used for the adjustment of sound level balance.



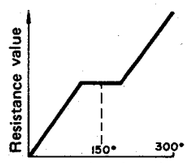
Characteristic (B)



Characteristic (C)

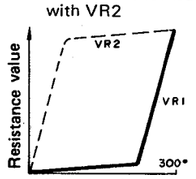


Characteristic (A)

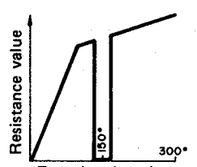


Characteristic (G)

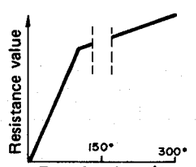
VR1 is inter locked with VR2



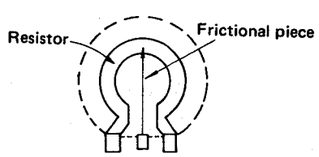
Characteristic (BH)



Characteristic (C): short-circuited at center



Characteristic (C): opened at center



■ REPLACEMENT PARTS LIST ..... Electrical Parts

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number of parts orders.
2. ⚠ indicates that only parts specified by the manufacturer be used for safety.
3. Bracket indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Areas
* [E] and [EG] are available in Scandinavia and European.
* [XAL] is available in Australia.
* [XA] is available in Asia, Latin America, Middle East and Africa.
* [XGH] is available in Holland.
* [EB] is available in Belgium.

Ref. No.		Part No.	Part Name & Description
INTEGRATED CIRCUIT			
IC101		SVIUPC1167C2	IC, FM IF Amp. & EM Detector
IC102		AN6552F	IC, Muting & Meter Amplifier
IC201		AN217P–BB	IC, AM & FM IF Amplifier
IC301		AN363N	IC, FM Multiplex
IC401, 402		SVITA7322P	IC, Equalizer Amplifier
IC501		AN6552F	IC, Tone Amplifier
IC601, 602		SVISTK8050	IC, Synchronous, Biass Circuit and Power Amplifier
IC603		SVITA7317P	IC, Speakers Protection
IC701		SVITA78L006A	IC, Regulator
IC702		SVIBA6208	IC, Moter Driver
IC901		SVIUPB553C–E	IC, Pre-Scaler
IC902		SVIUPD1704CL	IC, Micro-Computer
IC903		SVITC5067BP	IC, FL Driver
IC904		AN6876	IC, LED Driver
IC905		SVIM74LS42P	IC, Decoder
TRANSISTORS			
Q1		3SK74–L1	Transistor, FM RF Amplifier [FET]
Q2~4		2SC2295	Transistor, FM Oscillator & Buffer (Chip)
Q5		2SC2404	Transistor, FM Mixer (Chip)
Q6, 202, 301, 302, 305, 910, 912, 914, 915, 916		2SB709	Transistor, Switching, AF Amplifier, Buffer & Driver (Chip)
Q7, 103, 104, 105, 203, 204, 906, 907, 909, 913		2SD601	Transistor, Switching & Driver (Chip)
Q101, 102, 201		2SC2778	Transistor, FM IF Amplifier & Buffer (Chip)
Q205, 918		2SC1684–R	Transistor, Switching (Use in ranks R or S)
Q303, 304		2SD601	Transistor, Mute Switching (Chip)
Q601~604		2SC2320L–F	Transistor, Differential Amplifier (Use in ranks F or G)
Q605~608		2SC2631–R	Transistor, Differential (Use in ranks R, S or T)
Q609~612		**2SA666AI–R**	Transistor, Current Mirror (Product Part No. 2SA564–Q or R)
Q613, 614		2SA921–T	Transistor, Pre-Driver (Use in ranks Q, R or S)
Q615, 616, 711		2SA1124–R	Transistor, Pre-Driver (Use in ranks R, S or T)
Q617, 618		2SC2632–R	Transistor, Constant Current (Use in ranks R, S or T)
Q619, 620, 622, 623		2SC1845	Transistor, Current Detector & LED Driver
Q621		2SA992	Transistor, Relay Hold
Q701, 712		2SA1015–Y	Transistor, Regulator (Use in ranks Y or O)
Q702		2SD880–Y	Transistor, Regulator
Q703		2SK34–D1	Transistor, Current Stabilizer [FET]
Q705, 708		2SC1815–Y	Transistor, Regulator & Switching (Use in ranks Y or O)
Q706, 710		2SC2632–R	Transistor, Regulator
Q707		2SD762–O	Transistor, Regulator (Use in ranks O or P)
Q709		2SC1509–R	Transistor, Switching (Use in ranks Q, R or S)
Q901~905		2SD601A	Transistor, Loop Filter (Chip)
Q908		2SB709A	Transistor, Buffer (Chip)
DIODES			
D1~4		SVDBB204	Diode, Variable Capacitor (for FM)
D101~105, 202~204, 206, 301, 603, 604, 616		**MA162A**	Diode, Switching, AGC & Detector (Product Part No. MA150)
D201		SVDBB113	Diode, Variable Capacitor (for AM)
D205		**2–0A90**	Diode, AM Detector
D401~403		LN224RP	Light Emitting Diode, Green
D404, 405		LN424YP	Light Emitting Diode, Yellow
D601, 602		**MA162A**	Diode
D605~612		**2–0A90**	Diode, Synchronous Biass
D613, 614, 617		**MA162A**	Diode, Detector & Relay Pulse Killer
D615	⚠	**SVDSR1K2**	Rectifier
D618		LN417YP	Light Emitting Diode, Yellow
D619		LN217RP	Light Emitting Diode, Red
D701~704	⚠	**SVDS3V40**	Rectifier
D705, 706, 709, 710, 713, 716, 718, 915	⚠	**SVDSR1K2**	Rectifier
D707, 708		SVDMZ318B	Diode, 18V Zener
D712, 715, 719, 720		SVDMZ316A	Diode, 16V Zener
D714		**SVDEQA0113RA**	Diode, 13V Zener (Product Part No. MA1130A)
D717		SVDMZ307C1	Diode, 8V Zener
D721		SVDMZ304A	Diode, 4V Zener
D901, 904~914, 916, 918~926, 940, 943, 945~947		**MA162A**	Diode (Product Part No. MA150)
D902		SVDMZ303A	Diode, 3V Zener
D903		**2–0A99**	Diode
D917		**RVDRD6R2EB**	Diode, 6.2V Zener (Product Part No. MA1062A)
D927~933, 939		LN217RP	Light Emitting Diode, Red
D934~938		LN417YP	Light Emitting Diode, Yellow
D942		LN224RP	Light Emitting Diode, Red
D944		SVDMZ327B	Diode, 27V Zener
COILS and TRANSFORMERS			
L1		SLA4P43	Coil, FM Antenna
L2		SLO4P67–P	Coil, FM Local Oscillator
L3, 4		SLD4P35–P	Coil, FM RF Detector
L5		ELQ5A77	Coil, Choke
L6		SLAA4W1–3	Coil, FM Antenna Balun
L101		SLQW270–1K	Coil, Choke
L102		SLM1C61–P	Coil, Choke
L201		SLF2D69–1	Coil, AM Ferrite Bar Antenna
L202		SLO2C25–P	Coil, AM Local Oscillator
L601, 602		SLQY15G–30	Coil, Choke
L701, 702		SLQX391-P	Coil, Choke
L901		RLQY25S5–0	Coil, Choke
T101		SLI4C511–K	Transformer, FM IF Discriminator
T102		SLI4C513–K	Transformer, FM IF Discriminator
T201		SLI2C127	Transformer, AM IF
T202		SLI2C413R	Transformer, AM IF
T701	⚠	SLT5P201	Transformer, Power Source
CERAMIC FILTERS			
CF101, 102, 103, 105		SVFE107MM–A	Ceramic Filter, 10.7MHz (Red)
		SVFE107MM–B	Ceramic Filter, 10.68MHz (Blue)
		SVFE107MM–C	Ceramic Filter, 10.72MHz (Orange)
CF104		SVFE107MZ2–A	Ceramic Filter, 10.7MHz (Red)
		SVFE107MZ2–B	Ceramic Filter, 10.675MHz (Blue)
		SVFE107MZ2–C	Ceramic Filter, 10.725MHz (Orange) (Use pair ranks as same as CF101~104 and 105)
CF201		SVFSFP450HT	Ceramic Filter, AM 450kHz
CRYSTAL			
X901		SVQ43U452	Crystal, Counter Oscillator (4.5MHz)
VARIABLE RESISTORS			
VR1-1, 1-2		EUWMCB063BF5	Volume Control (with motor)
VR2		EVBV35C20C15	Bass Control, 100kΩ(C)
VR3		EVBV37C20C15	Treble Control, 100kΩ(C)
VR4		EVAV32C20G25	Balance Control, 250kΩ(G)
VR101		**EVTS3MA00B34**	Muting Level Adjustment, 30kΩ(B)
VR102		**EVTS3MA00B24**	Signal LED Meter Adjustment, 20kΩ(B)
VR301		**EVTS3MA00B53**	PLL MPX Adjustment, 5kΩ(B)
VR302		**EVTS3MA00B14**	Normal Separation Adjustment, 10kΩ(B)
VR303		**EVTS0AA00B14**	Narrow Separation Adjustment, 10kΩ(B)
VR603, 604		**EVNM4AA00B53**	ICQ Adjustment, 5kΩ(B)
VARIABLE CAPACITORS			
CT1		ECV1ZW06X32E	Trimmer, FM Local Oscillator
CT201		ECV1ZW10X32	Trimmer, AM Antenna
THERMISTERS			
TH101, 102		ERTD2FHL103S	Thermister, Thermal Compensation, 10kΩ
TH601, 602		ERTD2FHL103S	Thermister, Thermal Compensation, 10kΩ
FUSES			
F1	⚠	XBA2C40TR0	Fuse, Power Source (T4.0A, 250V)
F2	⚠	XBA2C20TR0	Fuse, Power Source (T2.0A, 250V)
F3, 4	⚠	XBA2C10TR0	Fuse, Power Source (T1.0A, 250V)

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Ref. No.		Part No.	Part Name & Description
LAMP			
PL1	⚠	XAMR53S	Lamp, 6.3V 250mA
COMPONENT COMBINATIONS			
Z601, 602	⚠	ECQJ0517	Component Combination, 10Ω & 0.047μF
Z701~705		EXRFS203ZS	Component Combination, 0.01μF (x2)
Z901, 902		EXBP87104K	Component Combination, 100kΩ (x7)
Z903, 904		EXFP7331M	Component Combination, 330pF (x7)
FLUORESCENT DISPLAY TUBE			
FL		SAD7MT09ZA	Fluorescent Display Tube
RELAY			
RLY1	⚠	SSY69	Relay, Speaker Protection
SWITCHES			
S1~5		SSH527	Switch, Input Selector & Tape Monitor
S6~9, 12~14		SSH707	Switch, Audio Muting/Loudness/Subsonic Filter/High Filter/FM IF Band/FM Muting/ Auto Scan
S10, 11		SSH289	Switch, Speaker Selector
S15	⚠	SSH119	Switch, Power Source
S16	⚠	ESE37200	Switch, Voltage Adjustment
S17, 18		SSG5	Switch, Volume "up" and "down"
S101, 913		ESD14116	Switch, FM Antenna & FM/AM Allocation Selector
S901~912		SSG1	Switch, Memory/Preset/FM-AM/Manual
RESISTOR			
R1		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R2, 3		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R4		RRD18XK223	Chip, 22kΩ, 1/8W, ±10%
R5		RRD18XK563	Chip, 56kΩ, 1/8W, ±10%
R6		**ERD25FJ100**	Carbon, 10Ω, 1/4W, ±5%
R7		RRD18XK223	Chip, 22kΩ, 1/8W, ±10%
R8		**ERD10TJ470**	Carbon, 47Ω, 1/8W, ±5%
R9		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R10		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R11		RRD18XK122	Chip, 1.2kΩ, 1/8W, ±10%
R12		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R13		RRD18XK473	Chip, 47kΩ, 1/8W, ±10%
R14, 15		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R16		RRD18XK221	Chip, 220Ω, 1/8W, ±10%
R17		RRD18XK472	Chip, 4.7kΩ, 1/8W, ±10%
R18		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R19		RRD18XK822	Chip, 8.2kΩ, 1/8W, ±10%
R20		RRD18XK221	Chip, 220Ω, 1/8W, ±10%
R21		RRD18XK332	Chip, 3.3kΩ, 1/8W, ±10%
R22		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R23		RRD18XK821	Chip, 820Ω, 1/8W, ±10%
R24		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R25		RRD18XK821	Chip, 820Ω, 1/8W, ±10%
R27		RRD18XK222	Chip, 2.2kΩ, 1/8W, ±10%
R28		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R29		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R31		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ±5%
R32		**ERD25TJ184**	Carbon, 180kΩ, 1/4W, ±5%
R33		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R101		RRD18XK681	Chip, 680Ω, 1/8W, ±10%
R102		RRD18XK222	Chip, 2.2kΩ, 1/8W, ±10%
R103, 104		RRD18XK331	Chip, 330Ω, 1/8W, ±10%
R105		RRD18XK152	Chip, 1.5kΩ, 1/8W, ±10%
R106		RRD18XK391	Chip, 390Ω, 1/8W, ±10%
R107		RRD18XK152	Chip, 1.5kΩ, 1/8W, ±10%
R108		RRD18XK331	Chip, 330Ω, 1/8W, ±10%
R109		RRD18XK221	Chip, 220Ω, 1/8W, ±10%
R110		RRD18XK562	Chip, 5.6kΩ, 1/8W, ±10%
R111		RRD18XK223	Chip, 22kΩ, 1/8W, ±10%
R112		RRD18XK562	Chip, 5.6kΩ, 1/8W, ±10%
R113		RRD18XK222	Chip, 2.2kΩ, 1/8W, ±10%
R114		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R115		RRD18XK331	Chip, 330Ω, 1/8W, ±10%
R116		RRD18XK824	Chip, 820kΩ, 1/8W, ±10%
R117		RRD18XK153	Chip, 15kΩ, 1/8W, ±10%
R118		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R119		**ERD10TJ472**	Carbon, 4.7kΩ, 1/8W, ±5%
R120		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R121		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R122		**ERD10TJ470**	Carbon, 47Ω, 1/8W, ±5%
R123		**ERD25FJ472**	Carbon, 4.7kΩ, 1/4W, ±5%
R124		**ER025CKF5601**	Metal Film, 5.6kΩ, 1/4W, ±1%
R125		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R127		RRD18XK223	Chip, 22kΩ, 1/8W, ±10%
R128		RRD18XK222	Chip, 2.2kΩ, 1/8W, ±10%

Ref. No.		Part No.	Part Name & Description
R129		RRD18XK473	Chip, 47kΩ, 1/8W, ±10%
R130		RRD18XK332	Chip, 3.3kΩ, 1/8W, ±10%
R131		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R132		RRD18XK824	Chip, 820kΩ, 1/8W, ±10%
R133		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R134		RRD18XK153	Chip, 15kΩ, 1/8W, ±10%
R135		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R136		RRD18XK334	Chip, 330kΩ, 1/8W, ±10%
R137		RRD18XK473	Chip, 47kΩ, 1/8W, ±10%
R138		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R139		RRD18XK183	Chip, 18kΩ, 1/8W, ±10%
R140		**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%
R141		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R143		RRD18XK473	Chip, 47kΩ, 1/8W, ±10%
R144, 145		RRD18XK100	Chip, 10Ω, 1/8W, ±10%
R202		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R203		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R205		**ERD10TJ562**	Carbon, 5.6kΩ, 1/8W, ±5%
R206		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R207		RRD18XK822	Chip, 8.2kΩ, 1/8W, ±10%
R208		RRD18XK222	Chip, 2.2kΩ, 1/8W, ±10%
R209		RRD18XK561	Chip, 560Ω, 1/8W, ±10%
R210		RRD18XK151	Chip, 150Ω, 1/8W, ±10%
R211		RRD18XK332	Chip, 3.3kΩ, 1/8W, ±10%
R212		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R213		RRD18XK222	Chip, 2.2kΩ, 1/8W, ±10%
R214		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R215		RRD18XK473	Chip, 47kΩ, 1/8W, ±10%
R216, 217		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R218		RRD18XK394	Chip, 390kΩ, 1/8W, ±10%
R219		RRD18XK392	Chip, 3.9kΩ, 1/8W, ±10%
R220		RRD18XK222	Chip, 2.2kΩ, 1/8W, ±10%
R221		RRD18XK471	Chip, 470Ω, 1/8W, ±10%
R222		RRD18XK562	Chip, 5.6kΩ, 1/8W, ±10%
R223		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R224		RRD18XK154	Chip, 150kΩ, 1/8W, ±10%
R225		RRD18XK273	Chip, 27kΩ, 1/8W, ±10%
R226		RRD18XK472	Chip, 4.7kΩ, 1/8W, ±10%
R227		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R228		**ERD10TJ473**	Carbon, 47kΩ, 1/8W, ±5%
R230		**ERD10TJ332**	Carbon, 3.3kΩ, 1/8W, ±5%
R231		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R232		**ERD10TJ472**	Carbon, 4.7kΩ, 1/8W, ±5%
R233		**ERD10TJ473**	Carbon, 47kΩ, 1/8W, ±5%
R301		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R302		RRD18XK153	Chip, 15kΩ, 1/8W, ±10%
R303		RRD18XK101	Chip, 100Ω, 1/8W, ±10%
R304		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R306		RRD18XK101	Chip, 100Ω, 1/8W, ±10%
R307		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R308		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R309, 310		RRD18XK392	Chip, 3.9kΩ, 1/8W, ±10%
R311, 312		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R313, 314		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R315, 316		RRD18XK474	Chip, 470kΩ, 1/8W, ±10%
R317, 318		RRD18XK471	Chip, 470Ω, 1/8W, ±10%
R319, 320		RRD18XK392	Chip, 3.9kΩ, 1/8W, ±10%
R321, 322		RRD18XK224	Chip, 220kΩ, 1/8W, ±10%
R323		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R324		RRD18XK222	Chip, 2.2kΩ, 1/8W, ±10%
R401, 402		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R403, 404		**ERD10TJ221**	Carbon, 220Ω, 1/8W, ±5%
R405, 406		**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%
R407, 408		**ERD10TJ151**	Carbon, 150Ω, 1/8W, ±5%
R409, 410		**ERD10TJ332**	Carbon, 3.3kΩ, 1/8W, ±5%
R411, 412		**ER025CKF6801**	Metal Film, 6.8kΩ, 1/4W, ±1%
R413, 414		**ER025CKF1003**	Metal Film, 100kΩ, 1/4W, ±1%
R415, 416		**ERD10TJ471**	Carbon, 470Ω, 1/8W, ±5%
R417, 418		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ±5%
R419, 420		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ±5%
R421, 422		**ERD10TJ221**	Carbon, 220Ω, 1/8W, ±5%
R423, 424		RRD18XK824	Chip, 820kΩ, 1/8W, ±10%
R425, 426		RRD18XK824	Chip, 820kΩ, 1/8W, ±10%
R427, 428		**ERD10TJ472**	Carbon, 4.7kΩ, 1/8W, ±5%
R429, 430		**ERD10TJ472**	Carbon, 4.7kΩ, 1/8W, ±5%
R431, 432		**ERD25TJ394**	Carbon, 390kΩ, 1/4W, ±5%
R433, 434		RRD18XK124	Chip, 120kΩ, 1/8W, ±10%
R435, 436		**ERD25TJ184**	Carbon, 180kΩ, 1/4W, ±5%
R437, 438		**ERD10TJ472**	Carbon, 4.7kΩ, 1/8W, ±5%
R439, 440		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ±5%
R441, 442		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R443, 444		**ERD10TJ103**	Carbon, 10kΩ, 1/8W, ±5%
R445, 446		**ERD10TJ393**	Carbon, 39kΩ, 1/8W, ±5%

Ref. No.		Part No.	Part Name & Description
R447, 448		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R449, 450		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ±5%
R451, 452		**ERD10TJ122**	Carbon, 1.2kΩ, 1/8W, ±5%
R453		**ERD10TJ102**	Carbon, 1kΩ, 1/8W, ±5%
R501, 502		**ERD10TJ822**	Carbon, 8.2kΩ, 1/8W, ±5%
R503, 504		**ERD10TJ102**	Carbon, 1kΩ, 1/8W, ±5%
R505, 506		**ERD25FJ682**	Carbon, 6.8kΩ, 1/4W, ±5%
R507, 508		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%
R509, 510		**ERD25TJ334**	Carbon, 330kΩ, 1/4W, ±5%
R511, 512		**ERD10TJ153**	Carbon, 15kΩ, 1/8W, ±5%
R513, 514		**ERD10TJ223**	Carbon, 22kΩ, 1/8W ±5%
R515, 516		**ERD10TJ272**	Carbon, 2.7kΩ, 1/8W, ±5%
R517, 518		**ERD10TJ182**	Carbon, 1.8kΩ, 1/8W, ±5%
R519, 520		**ERD10TJ100**	Carbon, 10Ω, 1/8W, ±5%
R521, 522		**ERD10TJ223**	Carbon, 22kΩ, 1/8W, ±5%
R523, 524		**ERD25TJ564**	Carbon, 560kΩ, 1/4W, ±5%
R525, 526		**ERD10TJ223**	Carbon, 22kΩ, 1/8W, ±5%
R527, 528		**ERD10TJ223**	Carbon, 22kΩ, 1/8W, ±5%
R601, 602		**ERD10TJ152**	Carbon, 1.5kΩ, 1/8W, ±5%
R603, 604		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R605, 606		**ERD10TJ222**	Carbon, 2.2kΩ, 1/8W, ±5%
R607, 608		**ERD25TJ184**	Carbon, 180kΩ, 1/4W, ±5%
R609, 610		**ERD10TJ183**	Carbon, 18kΩ, 1/8W, ±5%
R611, 612		**ERD10TJ183**	Carbon, 18kΩ, 1/8W, ±5%
R613, 614		**ERD10TJ682**	Carbon, 6.8kΩ, 1/8W, ±5%
R615, 616		**ERD10TJ221**	Carbon, 220Ω, 1/8W, ±5%
R617, 618	⚠	**ERD25FJ101**	Carbon, 100Ω, 1/4W, ±5%
R619, 620	⚠	**ERD25FJ101**	Carbon, 100Ω, 1/4W, ±5%
R621, 622		**ERD10TJ272**	Carbon, 2.7kΩ, 1/8W, ±5%
R623, 624		**ERD10TJ272**	Carbon, 2.7kΩ, 1/8W, ±5%
R625, 626	⚠	**ERD25FJ330**	Carbon, 33Ω, 1/4W, ±5%
R627, 628		**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%
R629, 630		**ERD10TJ473**	Carbon, 47kΩ, 1/8W, ±5%
R631, 632	⚠	**ERD25FJ271**	Carbon, 270Ω, 1/4W, ±5%
R633, 634	⚠	**ERD25FJ330**	Carbon, 33Ω, 1/4W, ±5%
R635, 636	⚠	**ERD25FJ472**	Carbon, 4.7kΩ, 1/4W, ±5%
R637, 638		**ERD10TJ332**	Carbon, 3.3kΩ, 1/8W, ±5%
R639, 640	⚠	**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ±5%
R641, 642		**ERD10TJ333**	Carbon, 33kΩ, 1/8W, ±5%
R643, 644		**ERD10TJ222**	Carbon, 2.2kΩ, 1/8W, ±5%
R645, 646	⚠	**ERD50FJ562**	Carbon, 5.6kΩ, 1/2W, ±5%
R647, 648	⚠	**ERD50FJ562**	Carbon, 5.6kΩ, 1/2W, ±5%
R649, 650	⚠	**ERD50FJ100**	Carbon, 10Ω, 1/2W, ±5%
R651, 652	⚠	**ERD25FJ100**	Carbon, 10Ω, 1/4W, ±5%
R653	⚠	**ERD25FJ100**	Carbon, 10Ω, 1/4W, ±5%
R655, 656	⚠	**ERD25FJ391**	Carbon, 390Ω, 1/4W, ±5%
R657, 658		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R659, 660		**ERD10TJ272**	Carbon, 2.7kΩ, 1/8W, ±5%
R661, 662		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R663		**ERD10TJ333**	Carbon, 33kΩ, 1/8W, ±5%
R664	⚠	**ERD25FJ100**	Carbon, 10Ω, 1/4W, ±5%
R665		**ERD10TJ223**	Carbon, 22kΩ, 1/8W, ±5%
R666		**ERD10TJ153**	Carbon, 15kΩ, 1/8W, ±5%
R667		**ERD10TJ103**	Carbon, 10kΩ, 1/8W, ±5%
R668		**ERD10TJ822**	Carbon, 8.2kΩ, 1/8W, ±5%
R669		**ERD10TJ473**	Carbon, 47kΩ, 1/8W, ±5%
R670		**ERG1ANJ122**	Metal Oxide, 1.2kΩ, 1W, ±5%
R671		**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ±5%
R672	⚠	**ERD25FJ100**	Carbon, 10Ω, 1/4W, ±5%
R673		**ERD10TJ102**	Carbon, 1kΩ, 1/8W, ±5%
R674, 675		**ERD10TJ103**	Carbon, 10kΩ, 1/8W, ±5%
R676		**ERD25TJ124**	Carbon, 120kΩ, 1/4W, ±5%
R677		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%
R678		**ERG2ANJ331**	Metal Oxide, 330Ω, 2W, ±5%
R679	⚠	**ERD50FJ182**	Carbon, 1.8kΩ, 1/2W, ±5%
R681, 682		**ERG2ANJ331**	Metal Oxide, 330Ω, 2W, ±5%
R690		**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%
R695		**ERD25TJ473**	Carbon, 47kΩ, 1/2W, ±5%
R701	⚠	**ERD25FJ331**	Carbon, 330Ω, 1/4W, ±5%
R702, 703	⚠	**ERD50FJ222**	Carbon, 2.2kΩ, 1/2W, ±5%
R704		**ERG1ANJ681**	Metal Oxide, 680Ω, 1W, ±5%
R705		**ERD10TJ103**	Carbon, 10kΩ, 1/8W, ±5%
R706	⚠	**ERD50FJ220**	Carbon, 22Ω, 1/2W, ±5%
R707		**ERD10TJ151**	Carbon, 150Ω, 1/8W, ±5%
R708		**ERD10TJ122**	Carbon, 1.2kΩ, 1/8W, ±5%
R709		**ERD10TJ332**	Carbon, 3.3kΩ, 1/8W, ±5%
R710		**ERD10TJ471**	Carbon, 470Ω, 1/8W, ±5%
R711		**ERG1ANJ150**	Metal Oxide 15Ω, 1W, ±5%
R714		**ERD10TJ100**	Carbon, 10Ω, 1/8W, ±5%
R715		**ERD10TJ680**	Carbon, 68Ω, 1/8W, ±5%
R716		**ERD10TJ390**	Carbon, 39Ω, 1/8W, ±5%
R717		**ERD10TJ100**	Carbon, 10Ω, 1/8W, ±5%
R718		**ERD10TJ472**	Carbon, 4.7kΩ, 1/8W, ±5%

Ref. No.		Part No.	Part Name & Description
R719		**ERD10TJ151**	Carbon, 150Ω, 1/8W, ±5%
R720		**ERD10TJ151**	Carbon, 150Ω, 1/8W, ±5%
R721, 722		**ERD10TJ151**	Carbon, 150Ω, 1/8W, ±5%
R723		**ERD10TJ682**	Carbon, 6.8kΩ, 1/8W, ±5%
R724		**ERD10TJ822**	Carbon, 8.2kΩ, 1/8W, ±5%
R725	⚠	**ERD25FJ100**	Carbon, 10Ω, 1/4W, ±5%
R901, 902		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R903		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R904		RRD18XK223	Chip, 22kΩ, 1/8W, ±10%
R905		RRD18XK682	Chip, 6.8kΩ, 1/8W, ±10%
R906		RRD18XK822	Chip, 8.2kΩ, 1/8W, ±10%
R907		RRD18XK393	Chip, 39kΩ, 1/8W, ±10%
R908		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R909		RRD18XK563	Chip, 56kΩ, 1/8W, ±10%
R910		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R912		RRD18XK332	Chip, 3.3kΩ, 1/8W, ±10%
R913		RRD18XK152	Chip, 1.5kΩ, 1/8W, ±10%
R914		RRD18XK682	Chip 6.8kΩ, 1/8W, ±10%
R915		RRD18XK153	Chip, 15kΩ, 1/8W, ±10%
R916		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R917		RRD18XK100	Chip, 10Ω, 1/8W, ±10%
R918		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R919		RRD18XK824	Chip, 820kΩ, 1/8W, ±10%
R920		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R921		RRD18XK101	Chip, 100Ω, 1/8W, ±10%
R924		RRD18XK103	Chip, 10kΩ, 1/8W, ±10%
R925		**ER025CKF3302**	Metal Film, 33kΩ, 1/4W, ±1%
R926		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R927		RRD18XK152	Chip, 1.5kΩ, 1/8W, ±10%
R928		RRD18XK223	Chip, 22kΩ, 1/8W, ±10%
R929		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R930		RRD18XK104	Chip, 100kΩ, 1/8W, ±10%
R931		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ±5%
R932		RRD18XK331	Chip, 330Ω, 1/8W, ±10%
R934		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R935		RRD18XK223	Chip, 22kΩ, 1/8W, ±10%
R936		RRD18XK333	Chip, 33kΩ, 1/8W, ±10%
R937		RRD18XK473	Chip, 47kΩ, 1/8W, ±10%
R938		**ERD10TJ473**	Carbon, 47kΩ, 1/8W, ±5%
R939		**ERD10TJ333**	Carbon, 33kΩ, 1/8W, ±5%
R940		**ERD10TJ182**	Carbon, 1.8kΩ, 1/8W, ±5%
R941		**ERD10TJ332**	Carbon, 3.3kΩ, 1/8W, ±5%
R942		RRD18XK184	Chip, 180kΩ, 1/8W, ±10%
R943		**ERD10TJ102**	Carbon, 1kΩ, 1/8W, ±5%
R944		**ERD25FJ152**	Carbon, 1.5kΩ, 1/4W, ±5%
R945		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R946, 947		RRD18XK100	Chip, 10Ω, 1/8W, ±10%
R948		RRD18XK100	Chip, 10Ω, 1/8W, ±10%
R949		RRD18XK102	Chip, 1kΩ, 1/8W, ±10%
R950, 951		RRD18XK100	Chip, 10Ω, 1/8W, ±10%
R955		RRD18XK101	Chip, 100Ω, 1/8W, ±10%
R958, 959		RRD18XK100	Chip, 10Ω, 1/8W, ±10%

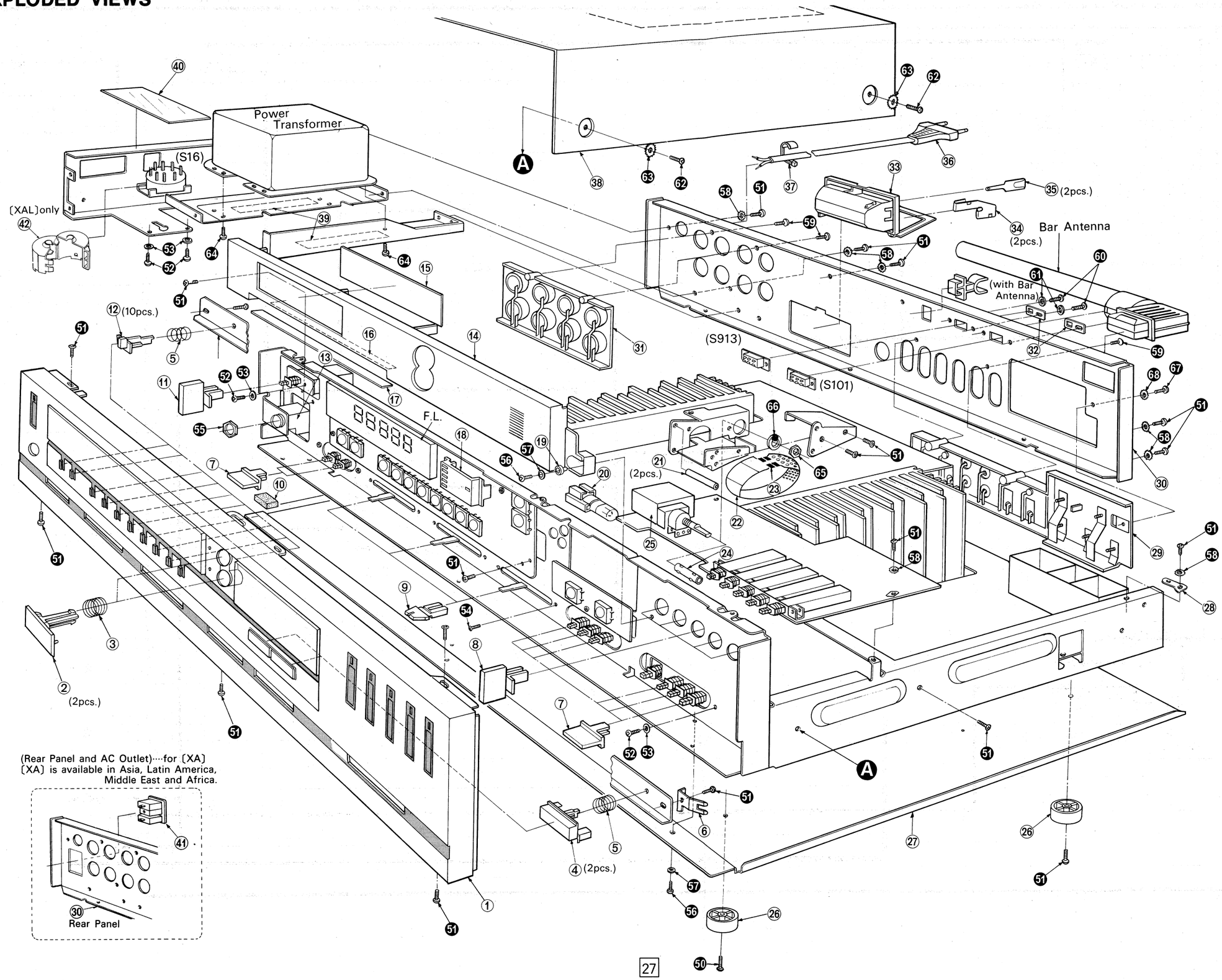
CAPACITOR

C1		ECUX1H103MD	Chip, 0.01μF, 50V, ±20%
C2, 3 [XAL] only		ECKD1H102MD	Ceramic, 0.001μF, 50V, ±20%
C3 [Except XAL]		ECUX1H102ZF	Chip, 0.001μF, 50V, $^{+80}_{-20}$%
C4		ECUX1H010CC	Chip, 1pF, 50V, ±0.25pF
C6		ECUX1H040DC	Chip, 4pF, 50V, ±0.25pF
C7		ECUX1H102ZF	Chip, 0.001μF, 50V, $^{+80}_{-20}$%
C8		ECUX1H103ZF	Chip, 0.01μF, 50V, $^{+80}_{-20}$%
C10		ECUX1H050DC	Chip, 5pF, 50V, ±0.25pF
C11, 12		ECKD1H102MDA	Ceramic, 0.001μF, 50V, ±20%
C13		ECUX1H030DC	Chip, 3pF, 50V, ±0.25pF
C14		ECGN5R22K	Ceramic, 0.22pF, 500V, ±10%
C15		ECUX1H390KC	Chip, 39pF, 50V, ±10%
C16		ECUX1H102ZF	Chip, 0.001μF, 50V, $^{+80}_{-20}$%
C17, 18		ECUX1H070DC	Chip, 7pF, 50V, ±0.5pF
C20		ECUX1H030DC	Chip, 3pF, 50V, ±0.25pF
C21		ECUX1H102ZF	Chip, 0.001μF, 50V, $^{+80}_{-20}$%
C22		ECUX1H020CC	Chip, 2pF, 50V, ±0.25pF
C23, 24		ECUX1H050DC	Chip, 5pF, 50V, ±0.25pF
C25		ECUX1H020CC	Chip, 2pF, 50V, ±0.25pF
C26		ECUX1H102ZF	Chip, 0.001μF, 50V, $^{+80}_{-20}$%
C27		ECUX1H050DC	Chip, 5pF, 50V, ±0.25pF
C28		ECUX1H181K	Chip, 180pF, 50V, ±10%
C29, 30		ECUX1H103ZF	Chip, 0.01μF, 50V, $^{+80}_{-20}$%
C31 [XAL] only		ECKD1H102MD	Ceramic, 0.001μF, 50V, ±20%
C40		ECCD1H220KC	Ceramic, 22pF, 50V, ±10%
C101, 102		ECUX1H223ZF	Chip, 0.022μF, 50V, $^{+80}_{-20}$%
C103		ECUX1H103ZF	Chip, 0.01μF, 50V, $^{+80}_{-20}$%

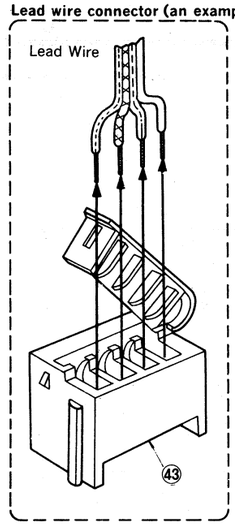
Ref. No.		Part No.	Part Name & Description
C104		ECUX1H560KC	Chip, 56pF, 50V, ±10%
C105, 106		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C107, 108		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C109, 110		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C111		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C112		**ECEA50Z1**	Electrolytic, 1μF, 50V
C113, 114		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C115		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C116		ECUX1H101K	Chip, 100pF, 50V, ±10%
C117		**ECEA50Z1**	Electrolytic, 1μF, 50V
C118		**ECEA50ZR22**	Electrolytic, 0.22μF, 50V
C119		**ECEA1HS100**	Electrolytic, 10μF, 50V
C120		**ECEA50ZR47**	Electrolytic, 0.47μF, 50V
C121, 122		ECKD1H223ZF	Ceramic, 0.022μF, 50V, +80 -20%
C123		ECUX1H470K	Chip, 47pF, 50V, ±10%
C124, 125		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C126		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C127		**ECEA50Z2R2**	Electrolytic, 2.2μF, 50V
C128		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C130		**ECEA50Z3R3**	Electrolytic, 3.3μF, 50V
C135		ECKD1H223ZF	Ceramic, 0.022μF, 50V, ±20%
C201		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C202		ECQM1H473KZ	Polyester, 0.047μF, 50V, ±10%
C203		ECUX1H100KC	Chip, 10pF, 50V, ±10%
C204		ECQP1241JZ	Polypropylene, 240pF, 100V, ±5%
C205		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C206		ECUX1H390KC	Chip, 39pF, 50V, ±10%
C207		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C208		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C209		ECUX1H103MD	Chip, 0.01μF, 50V, ±20%
C210, 211		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C212		**ECEA1JS4R7**	Electrolytic, 4.7μF, 63V
C213		ECUX1H470KC	Chip, 47pF, 50V, ±10%
C214		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C215		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C216, 217		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C218		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C219		ECQM1H473KZ	Polyester, 0.047μF, 50V, ±10%
C220		**ECEA50Z1**	Electrolytic, 1μF, 50V
C231 [XAL] only		ECKD1H102MD	Ceramic, 0.001μF, 50V, ±20%
C301		ECQP1471JZ	Polypropylene, 470pF, 100V, ±5%
C302		**ECEA1CS221**	Electrolytic, 220μF, 16V
C303		**ECEA50M4R7R**	Electrolytic, 4.7μF, 50V
C304		**ECEA50ZR22**	Electrolytic, 0.22μF, 50V
C305		**ECEA50ZR47**	Electrolytic, 0.47μF, 50V
C306		**ECEA1CS471**	Electrolytic, 470μF, 16V
C307		**ECEA50ZR47**	Electrolytic, 0.47μF, 50V
C308		ECQM1H473KZ	Polyester, 0.047μF, 50V, ±10%
C309, 310		ECQM1H123JZ	Polyester, 0.012μF, 50V, ±5%
C311, 312		**ECEA50Z1**	Electrolytic, 1μF, 50V
C313, 314		ECQM1H272JZ	Polyester, 0.0027μF, 50V, ±5%
C315, 316		ECUX1H471MD	Chip, 470pF, 50V, ±20%
C317, 318		ECQM1H222KZ	Polyester, 0.0022μF, 50V, ±10%
C319, 320		**ECEA50Z1**	Electrolytic, 1μF, 50V
C321		**ECEA50ZR47**	Electrolytic, 0.47μF, 50V
C401, 402		**ECEA50M3R3R**	Electrolytic, 3.3μF, 50V
C403, 404		ECCD1H101K	Ceramic, 100pF, 50V, ±10%
C405, 406		ECKD1H331KB	Ceramic, 330pF, 50V, ±10%
C407, 408		**ECEA1AS101**	Electrolytic, 100μF, 10V
C409, 410		ECKD1H222MD	Ceramic, 0.0022μF, 50V, ±20%
C411, 412		ECQP1103GZ	Polypropylene, 0.01μF, 100V, ±2%
C413, 414		ECQM1H102JZ	Polyester, 0.001μF, 50V, ±5%
C415, 416		ECQP1393GZ	Polypropylene, 0.039μF, 100V, ±2%
C417, 418	⚠	ECEA1HNR47S	Non-polar Electrolytic, 0.47μF, 50V
C419, 420		ECQM1H222KZ	Polyester, 0.0022μF, 50V, ±10%
C421, 422		**ECEA50Z1**	Electrolytic, 1μF, 50V
C423		ECKD1H333MD	Ceramic, 0.033μF, 50V, ±20%
C425, 426		ECCD1H820K	Ceramic, 82pF, 50V, ±10%
C427, 428		ECQM1H472KZ	Polyester, 0.0047μF, 50V, ±10%
C429, 430		ECQM1H473KZ	Polyester, 0.047μF, 50V, ±10%
C431, 432		ECQM1H473KZ	Polyester, 0.047μF, 50V, ±10%
C501, 502		ECQM1H152KZ	Polyester, 0.0015μF, 50V, ±10%

Ref. No.		Part No.	Part Name & Description
C503, 504		ECQM1H223KZ	Polyester, 0.022μF, 50V, ±10%
C505, 506		ECQM1H123JZ	Polyester, 0.012μF, 50V, ±5%
C507, 508		ECQM1H104KZ	Polyester, 0.1μF, 50V, ±10%
C509, 510		**ECEA1CS330**	Electrolytic, 33μF, 16V
C511, 512		**ECEA25Z4R7**	Electrolytic, 4.7μF, 25V
C513, 514		ECCD1H020C	Ceramic, 2pF, 50V, ±0.25pF
C515, 516		**ECEA1AS221**	Electrolytic, 220μF, 10V
C517, 518		**ECEA50Z3R3**	Electrolytic, 3.3μF, 50V
C519, 520		ECQS1271JZ	Polypropylene, 270pF, 125V, ±5%
C521, 522		ECQM1H332KZ	Polyester, 0.0033μF, 50V, ±10%
C601, 602		**ECEA50M3R3R**	Electrolytic, 3.3μF, 50V
C603, 604		ECCD1H101K	Ceramic, 100pF, 50V, ±10%
C605, 606		ECCD1H680K	Ceramic, 68pF, 50V, ±10%
C607, 608		ECKD1H821KB	Ceramic, 820pF, 50V, ±10%
C609, 610		ECCD2H180K	Ceramic, 18pF, 500V, ±10%
C611, 612		**ECEA2AS3R3**	Electrolytic, 3.3μF, 100V
C613, 614		ECCD1H270K	Ceramic, 27pF, 50V, ±10%
C615, 616		ECCD1H220K	Ceramic, 22pF, 50V, ±10%
C621, 622	⚠	**ECEA1HN3R3S**	Non-polar Electrolytic, 3.3μF, 50V
C623	⚠	ECEA1CN101S	Non-polar Electrolytic, 100μF, 16V
C624		**ECEA50Z2R2**	Electrolytic, 2.2μF, 50V
C625		**ECEA50Z1**	Electrolytic, 1μF, 50V
C626		**ECEA2AS100**	Electrolytic, 10μF, 100V
C627		**ECEA1CS330**	Electrolytic, 33μF, 16V
C628		**ECEA50ZR47**	Electrolytic, 0.47μF, 50V
C701, 702		ECKDKC103PF	Ceramic, 0.01μF, 400VAC, +100 -0%
C703, 704		ECETS1HV822U	Electrolytic, 8200μF, 50V
C705		**ECEA1VS221**	Electrolytic, 220μF, 35V
C706		**ECEA1JS221**	Electrolytic, 220μF, 63V
C707		**ECEA1VS101**	Electrolytic, 100μF, 35V
C708		**ECEA1JS101**	Electrolytic, 100μF, 63V
C710		ECKD1H103ZF	Ceramic, 0.01μF, 50V, +80 -20%
C711		**ECEA1ES101**	Electrolytic, 100μF, 25V
C712		**ECEA1VS331**	Electrolytic, 330μF, 35V
C713		**ECEA1ES101**	Electrolytic, 100μF, 25V
C714, 715		ECKD1H103ZF	Ceramic, 0.01μF, 50V, +80 -20%
C716		**ECEA1ES101**	Electrolytic, 100μF, 25V
C717		**ECEA1VS471**	Electrolytic, 470μF, 35V
C718		**ECEA1VS221**	Electrolytic, 220μF, 35V
C719		**ECEA1AS221**	Electrolytic, 220μF, 10V
C720		**ECEA1CS471**	Electrolytic, 470μF, 16V
C721		**ECEA1ES101**	Electrolytic, 100μF, 25V
C722, 723		**ECEA1ES101**	Electrolytic, 100μF, 25V
C724, 725		ECKD1H103ZF	Ceramic, 0.01μF, 50V, +80 -20%
C726		ECKD1H103ZF	Ceramic, 0.01μF, 50V, +80 -20%
C727	⚠	ECEA1CN100S	Non-polar Electrolytic, 10μF, 16V
C728, 729		ECKY2H102WE5	Ceramic, 0.001μF, 100V, +200 -0%
C901		**ECEA1HS101**	Electrolytic, 100μF, 50V
C902		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20
C903		**ECEA50M2R2R**	Electrolytic, 2.2μF, 50V
C904, 905		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C906		**ECEA50MR33R**	Electrolytic, 0.33μF, 50V
C907		**ECEA1AS221**	Electrolytic, 220μF, 10V
C908		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C909		**ECEA1AS101**	Electrolytic, 100μF, 10V
C910		**ECEA1HS100**	Electrolytic, 10μF, 50V
C911		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C912		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C913		ECQM1H333KZ	Polyester, 0.033μF, 50V, ±10%
C914		**ECEA1CS330**	Electrolytic, 33μF, 16V
C915		ECUX1H220KC	Chip, 22pF, 50V, ±10%
C916		ECUX1H180KC	Chip, 18pF, 50V, ±10%
C917		ECUX1H080DC	Chip, 8pF, 50V, ±0.5pF
C918		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C919		**ECEA0JS102**	Electrolytic, 1000μF, 6.3V
C920		**ECEA1HS470**	Electrolytic, 47μF, 50V
C921		**ECEA1AS102**	Electrolytic, 1000μF, 10V
C922		ECUX1H223ZF	Chip, 0.022μF, 50V, +80 -20%
C923		ECKD1H223ZF	Ceramic, 0.022μF, 50V, +80 -20%
C925, 926		**ECEA1HS100**	Electrolytic, 10μF, 50V
C927		**ECEA50Z3R3**	Electrolytic, 3.3μF, 50V
C928		ECUX1H103ZF	Chip, 0.01μF, 50V, +80 -20%
C936		ECKD1H223ZF	Ceramic, 0.022μF, 50V, +80 -20%

■ EXPLODED VIEWS



Lead wire connector (an example)



(Rear Panel and AC Outlet)····for [XA]
[XA] is available in Asia, Latin America, Middle East and Africa.

■ REPL

Notes: 1. Part
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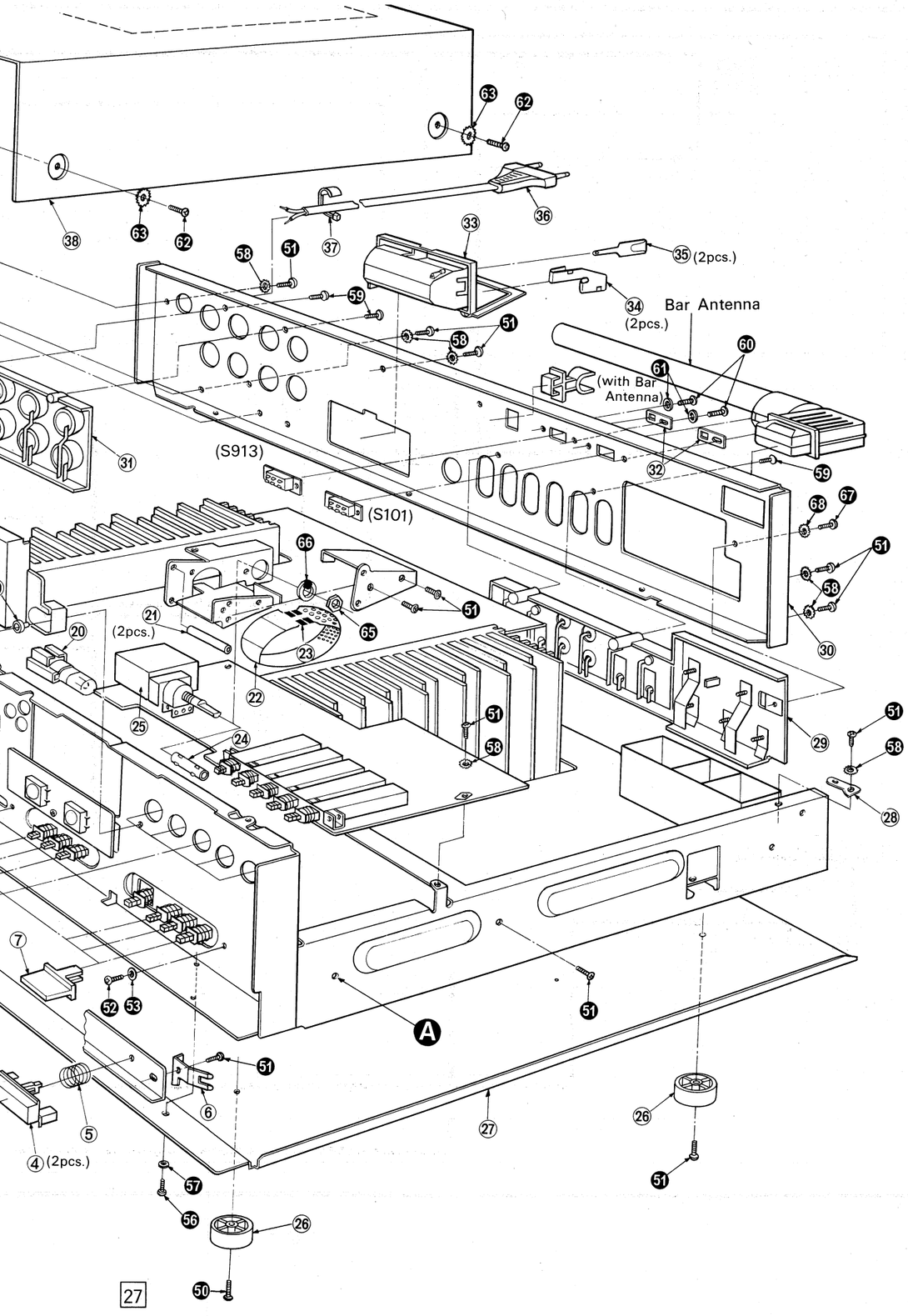
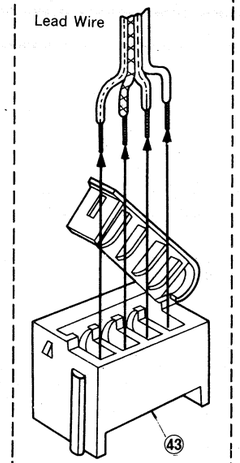
36 [XAL] only	⚠

Areas

* [E] and [EG
* [XAL] is ava
* [XA] is avail
* [XGH] is ava
* [EB] is avail



Lead wire connector (an example)



■REPLACEMENT PARTS LIST ····· Cabinet and Chassis Parts

Notes: 1. Parts numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. ⚠ indicates that only parts specified by the manufacturer be used for safety.
3. Ⓚ -marked parts are used for black type only, while ○ -marked parts are for silver type only.
4. Parts other than Ⓚ -and ○ -marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

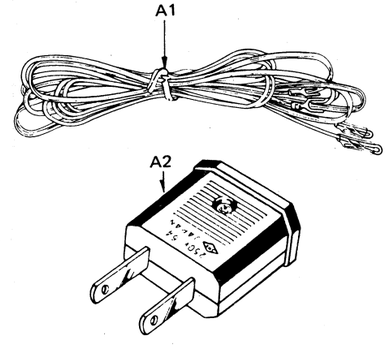
Black type model No. SA-515 (K)

Ref. No.		Part No.	Part Name & Description
CABINET and CHASSIS PARTS			
1	○	SGWA515E	Panel, Front Ass'y
1	Ⓚ	SGWA515KE	Panel, Front Ass'y (Black)
2		SBC299	Button, Tuning Up/Down Switch
3		SUS221	Spring, Tuning Up/Down Switch
4		SBC297	Button, Volume Up/Down Switch
5		SUS163	Spring, Push Switches
6		SUS185–1	Spring, Earth
7	○	SBC303	Button, Push Switches
7	Ⓚ	SBC303–1	Button, Push Switches (Black)
8	○	SBC301–2	Button, Selector and Tape Switches
8	Ⓚ	SBC301–3	Button, Selector and Tape Switches (Black)
9	○	SBC305	Button, Balance, Treble and Bass
9	Ⓚ	SBC305–1	Button, Balance, Treble and Bass (Black)
10		SHG1537	Rubber Cushion, Front Panel
11	○	SBC301	Button, Power Switch
11	Ⓚ	SBC301–1	Button, Power Switch (Black)
12		SBC295	Button, FM, AM, Preset-tuning and Memory Switches
13		XCJ6P21B–A1	Jack, Headphones
14	○	SGX6847	Ornament, Fluorescent Display Tube
14	Ⓚ	SGX6847–1	Ornament, Fluorescent Display Tube (Black)
15		SDU29-1	Filter, Display Window
16		SHP9333	Paper, Ornament Indicator Window
17		SHP9331	Paper, Ornament Indicator Window
18		SHR9519	Cover, Signal Level Indicator
19		SHR9339	Spacer, F.L Ornament M'tg
20		SJS2103	Socket, Pilot Lamp
21		SUB49	Pulley, Volume Level Film
22		SDU45	Film, Volume Level
23		SHR9521	Hinge, Volume Level Film Lock
24		SDG9001	Gear, Volume
25		SMC835	Cover, Volume
26		SKL227	Foot, Set
27		SKU8830	Bottom Board
28		RJT202B	Terminal, Ground
29		SJF8029–2N	Terminal, Antenna and Input
30 [E]		SGP2410–3A	Rear Panel
30 [XA]		SGP2410–4N	Rear Panel
30 [XAL]		SGP2410–5N	Rear Panel
30 [EG, EB, XGH]		SGPA515E	Rear Panel, SGP2410–3A with Name Plate (SGT22990)
31		SJF4813	Terminal, Speakers
32		SHR5073–1	Stopper, FM Antenna/Allocation Selector
33		SJB3005	Case, Battery
34		SJC9	Terminal, Battery Case
35		SJC7	Terminal, Battery Case
36	⚠	**SJA88**	AC Cord
36 [XAL] only	⚠	QFC1207M	AC Cord
37		SHR127	Bushing, AC Cord
37 [XAL] only		SHR131	Bushing, AC Cord
38	○	SKC550H1	Cabinet
38	Ⓚ	SKC550B1	Cabinet (Black)
39		SHS2457	Fiber
40		SMX367	Cover, Fuse P.C.B.
41 [XA] only	⚠	SJSA66–2	Socket, AC Outlet
42 [XAL] only		SUV453	Cover, Voltage Adjuster
43		SJS5327	Connector, Lead Wire, 3 pin
43		SJS5421	Connector, Lead Wire, 4 pin
43		SJS5627	Connector, Lead Wire, 6 pin
43		SJS5519	Connector, Lead Wire, 5 pin
SCREWS, WASHERS and NUTS			
51		**XTB3+8BFZ**	Screw, Tapping, ⊕3x8
52		**XSN3+6S**	Screw, ⊕3x6
53		**XWA3B**	Washer, Spring, ϕ3
54		**XSN2+4BVS**	Screw, ⊕2x4
55		**XNS12**	Nut, M12 (Headphone Jack)
56		**XTV3+8BFN**	Screw, Tapping, ⊕3x8
57		**XWG3**	Washer, Plain, ϕ3
58		**XWC3B**	Washer, External Toothed Lock, ϕ3
59		**XTB3+10BFZ**	Screw, Tapping, ⊕3x10
60		**XSN3+6BVS**	Screw, ⊕3x6
61		**XWA3BFZ**	Washer, Spring, ϕ3
62	○	**XTB4+8BFN**	Screw, Tapping, ⊕4x8 (Cabinet)
62	Ⓚ	**XTB4+8BFZ**	Screw, Tapping, ⊕4x8 (Cabinet)
63 [XAL] only		**XWC4B**	Washer, External Toothed Lock, ϕ4
64		**XTB4+8BFN**	Screw, Tapping, ⊕4x8 (Transformer & Bottom Board)
65		**XNS8**	Nut, M8
66		**XWV8**	Washer, Spring, ϕ8
67		**XTB3+8BFZ**	Screw, Tapping, ⊕ 3 x 8
67 [XAL] only		**XSTS3+8Z**	Screw, ⊕ 3 x 8
68		**XWC3B**	Washer, External Toothed Lock, ϕ3
ACCESSORIES			
A1		SSA267	Cord, FM Indoor Antenna
A2 [XA] only	⚠	SJP5213–1	Plug Adapter, AC Power
PACKING PARTS			
P1		SPP651	Polyethylene Bag
P2		SPS2839	Pad, Left Side
P2 [XAL] only		SPS2839–1	Pad, Left Side
P3		SPS2841	Pad, Right Side
P3 [XAL] only		SPS2841–1	Pad, Right Side
P4		SPG2723	Carton Box
P4 [XAL] only		SPG2725	Carton Box
P5		SQF10601	Instructions Book, Printed Matter
P5 [XA] only		SQF10605	Instructions Book, Printed Matter

Areas

* [E] and [EG] are available in Scandinavia and European.
* [XAL] is available in Australia.
* [XA] is available in Asia, Latin America, Middle East and Africa.
* [XGH] is available in Holland.
* [EB] is available in Belgium.

● Accessories



■ SCHEMATIC DIAGRAM (A and G P.C.B.)·····MODEL SA-515

(This schematic diagram may be modified at any time with the development of new technology.)

■ ANTENNA CAPACITORS

FM ANT
AM ANT
GND
300Ω
75Ω
L6
C2 M0.001
C3 M0.001
C31 M0.001
C231 M0.001

● Product for Australia [XAL] only

Q1 3SK74 FM RF AMP
Q2~4 2SC2295 FM OSC & BUFFER
Q5 2SC2404 MIXER
D1~4 SVDBB204
FM
AM ANT
normal
tuned type
(FM ANT)
S101
R31 56K
R32 180K
OSC
AM-RF
D201 SVDBB113
L201
L202
CT201
AM OSC
BLU
GRY
RED
BRN
BLK
(L ch)
PHONO
AUX
REC OUT TAPE 1 PLAYBACK
REC OUT TAPE 2 PLAYBACK
(Rch)
PHONO
AUX
REC OUT TAPE 1 PLAYBACK
REC OUT TAPE 2 PLAYBACK
REC/PLAY
A
Q201 2SC2778 BUFFER
Q6, 202 2SB709 SWITCHING
Q7, 203 2SD601 SWITCHING

Q101, 102 2SC2778 FM IF AMP
G
Q103 2SD601 SWITCHING
D104, 105 MA150
D101~103 MA150
Normal IF
Narrow IF
SEPARATION (narrow IF band)
IC 101 SVIμPC1167C2 FM IF AMP & DET
IC 201 AN217P AM/FM IF AMP
D202~204 MA150
D205 20A90
MUTING LEVEL
TP103
TP201
SIGNAL METER LEVEL
FM Positive Voltage Line
AM Positive Voltage Line
FM/AM band selection circuit
D301 MA150
IC 102 AN6552 MUTI & METER AMP
IC 301 AN3 MPX
PLL VCO

SA-515

(This schematic diagram may be modified at any time with the development of new technology.)

5 6 7 8 9 10 11 12 13 14

Q5 2SC2404 MIXER

Q101, 102 2SC2778 FM IF AMP

G

Q103 2SD601 SWITCHING

D104, 105 MA150

D101~103 MA150

Normal IF

Narrow IF

SEPARATION (narrow IF band)

IC 101 SVIμPC1167C2 FM IF AMP & DET

IC 201 AN217P AM/FM IF AMP

D202~204 MA150

D205 20A90

MUTING LEVEL

AM OSC

FM Positive Voltage Line

AM Positive Voltage Line

FM/AM band selection circuit

SIGNAL METER LEVEL

IC 102 AN6552 MUTI & METER AMP

D301 MA150

IC 301 AN363N MPX

PLL VCO

SEPARATION (normal IF band)

Q201 2SC2778 BUFFER

Q6, 202 2SB709 SWITCHING

Q7, 203 2SD601 SWITCHING

Q104, 105, 204 2SD601 SWITCHING & AF AMP

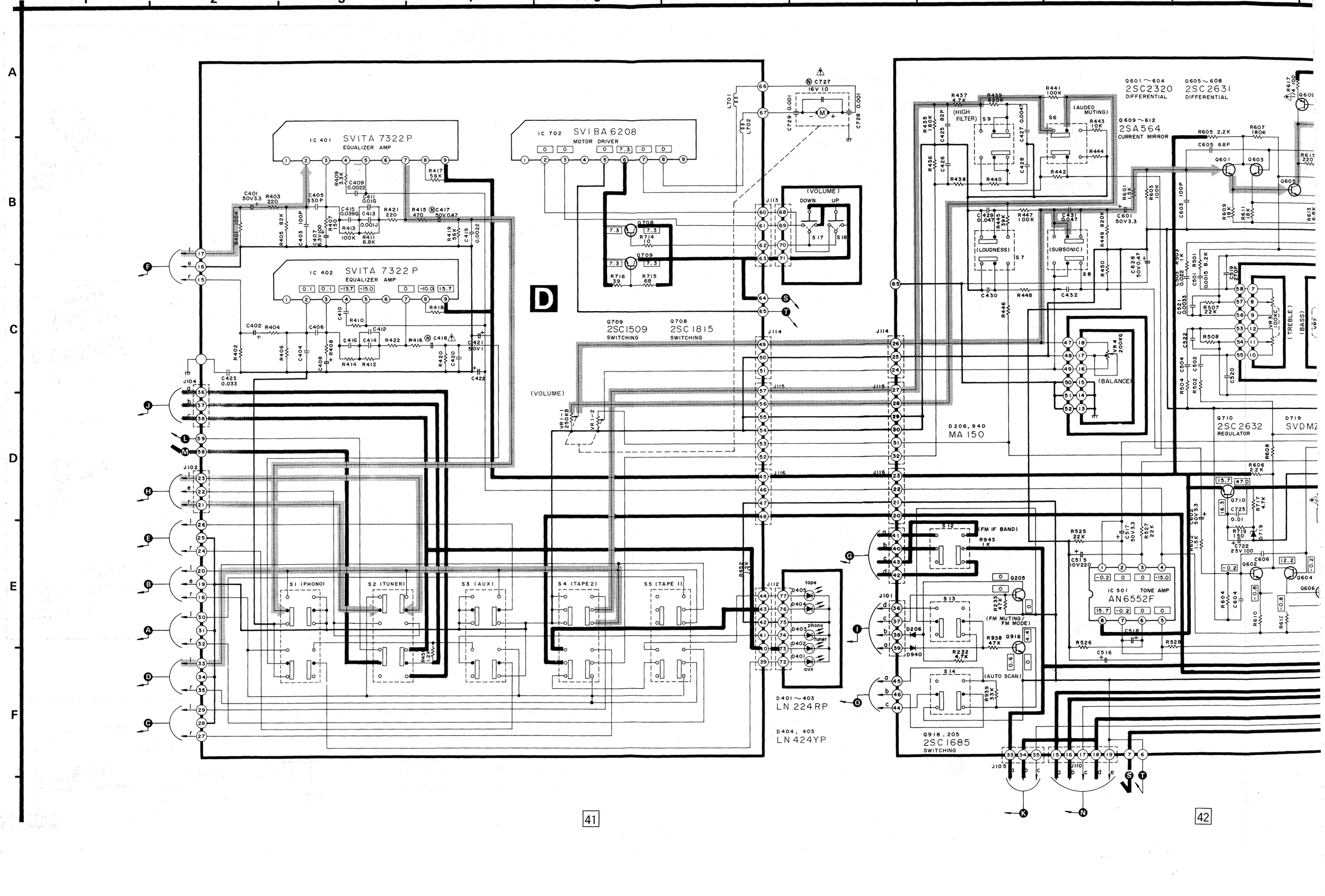
Q301, 302, 305 2SB709 AF AMP & MUTING

Q303, 304 2SD601 MUTING

31 32

■ SCHEMATIC DIAGRAM (D, E, F and H P.C.B.) ·····MODEL **SA-515**

(This schematic diagram may be modified at any time with the development of new technology.)

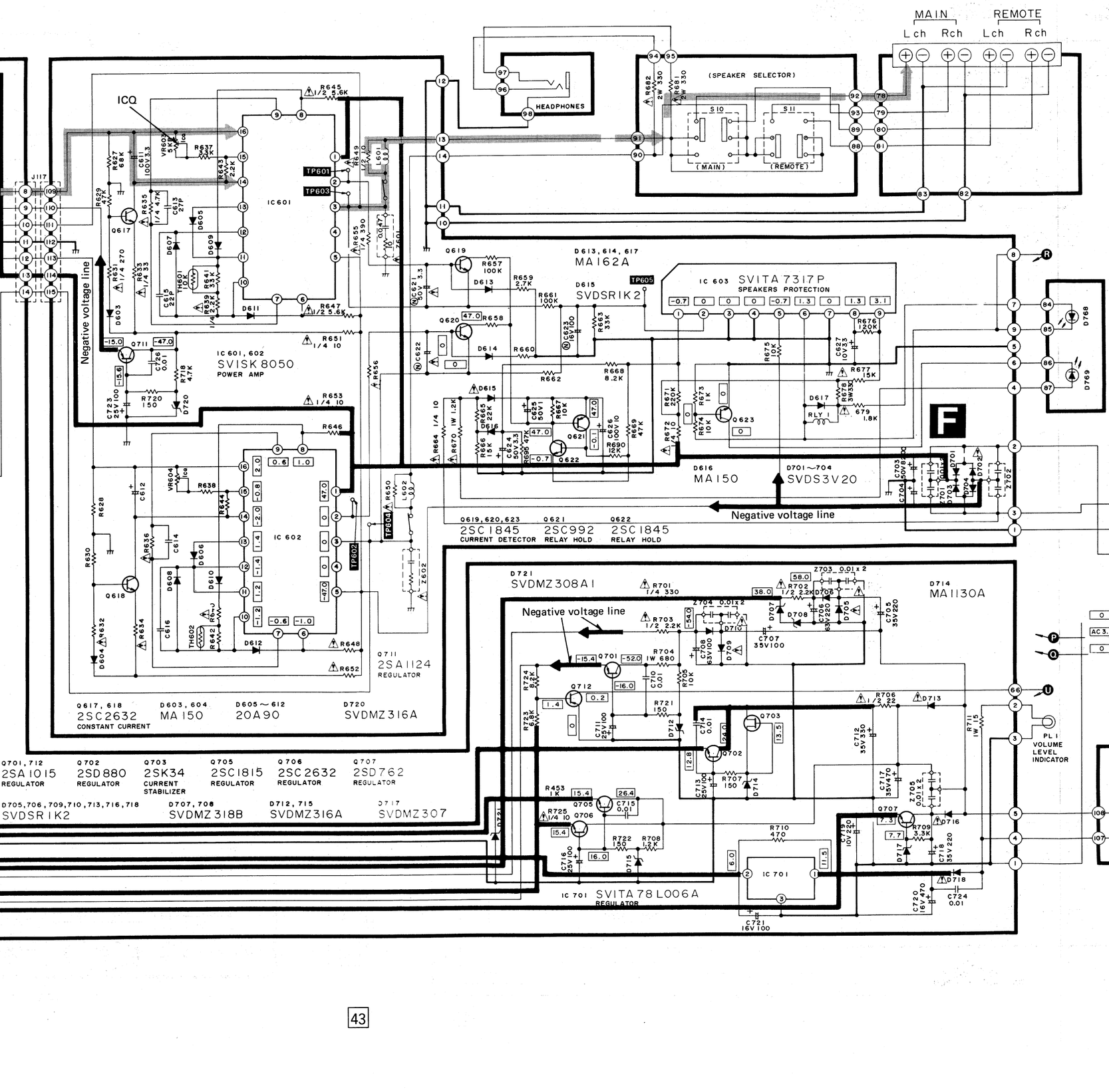


modified at any time with the development of new technology.)

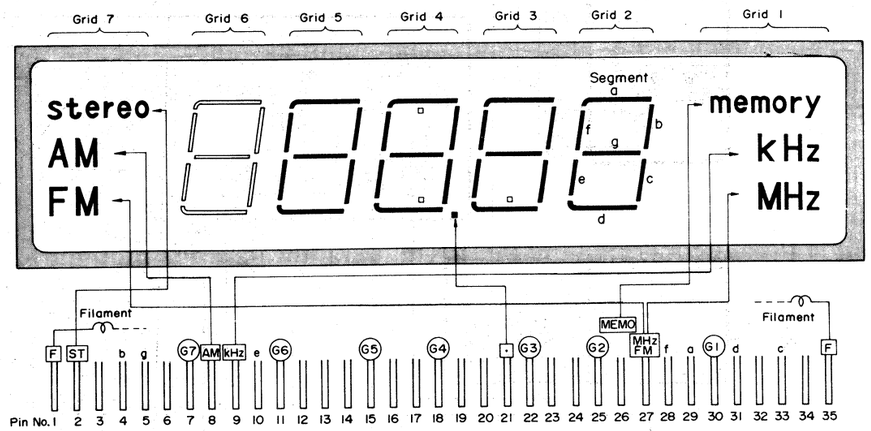
7 8 9 10 11 12 13 14 15 16 17

Q601~604 2SC2320 DIFFERENTIAL
Q605~608 2SC2631 DIFFERENTIAL
Q609~612 2SA564 CURRENT MIRROR
D601, 602 MA162A
Q613, 614 2SA921 PRE-DRIVER
Q615, 616 2SA1124 PRE-DRIVER
(HIGH FILTER) S9
(AUDEO MUTING) S6
(LOUDNESS) S7
(SUBSONIC) S8
(TREBLE) (BASS)
(BALANCE)
D206, 940 MA150
Q710 2SC2632 REGULATOR
D719 SVDMZ316A
IC 501 TONE AMP AN6552F
(FM IF BAND) S12
(FM MUTING/ FM MODE) S13
(AUTO SCAN) S14
Q205 Q206 Q940 Q918
Q918, 205 2SC1685 SWITCHING
ICQ
Negative voltage line
IC 601, 602 SVISK8050 POWER AMP
IC 601
IC 602
Q617, 618 2SC2632 CONSTANT CURRENT
D603, 604 MA150
D605~612 20A90
D720 SVDMZ316A
Q711 2SA1124 REGULATOR
HEADPHONES
(SPEAKER SELECTOR) S10 S11 (MAIN) (REMOTE)
D613, 614, 617 MA162A
D615 SVDSRIK2
IC 603 SVITA7317P SPEAKERS PROTECTION
D616 MA150
Q619, 620, 623 2SC1845 CURRENT DETECTOR
Q621 2SC992 RELAY HOLD
Q622 2SC1845 RELAY HOLD
Negative voltage line
Q701, 712 2SA1015 REGULATOR
Q702 2SD880 REGULATOR
Q703 2SK34 CURRENT STABILIZER
Q705 2SC1815 REGULATOR
Q706 2SC2632 REGULATOR
Q707 2SD762 REGULATOR
D705, 706, 709, 710, 713, 716, 718 SVDSRIK2
D707, 708 SVDMZ318B
D712, 715 SVDMZ316A
D717 SVDMZ307
D721 SVDMZ308A1
Negative voltage line
IC 701 SVITA78L006A REGULATOR

13 14 15 16 17 18 19 20 21 22



• Fluorescent Display Tube (FL)

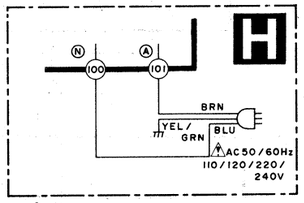


D768
LN417YP

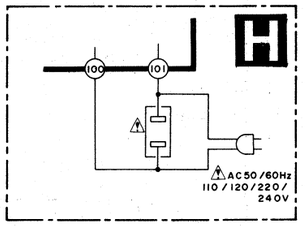
D769
LN217RP

■ POWER SOURCE CIRCUIT OF OTHER PRODUCTS

• Product for Australia [XAL] only



• Product for Asia, Latin America, Middle East and Africa [XA]



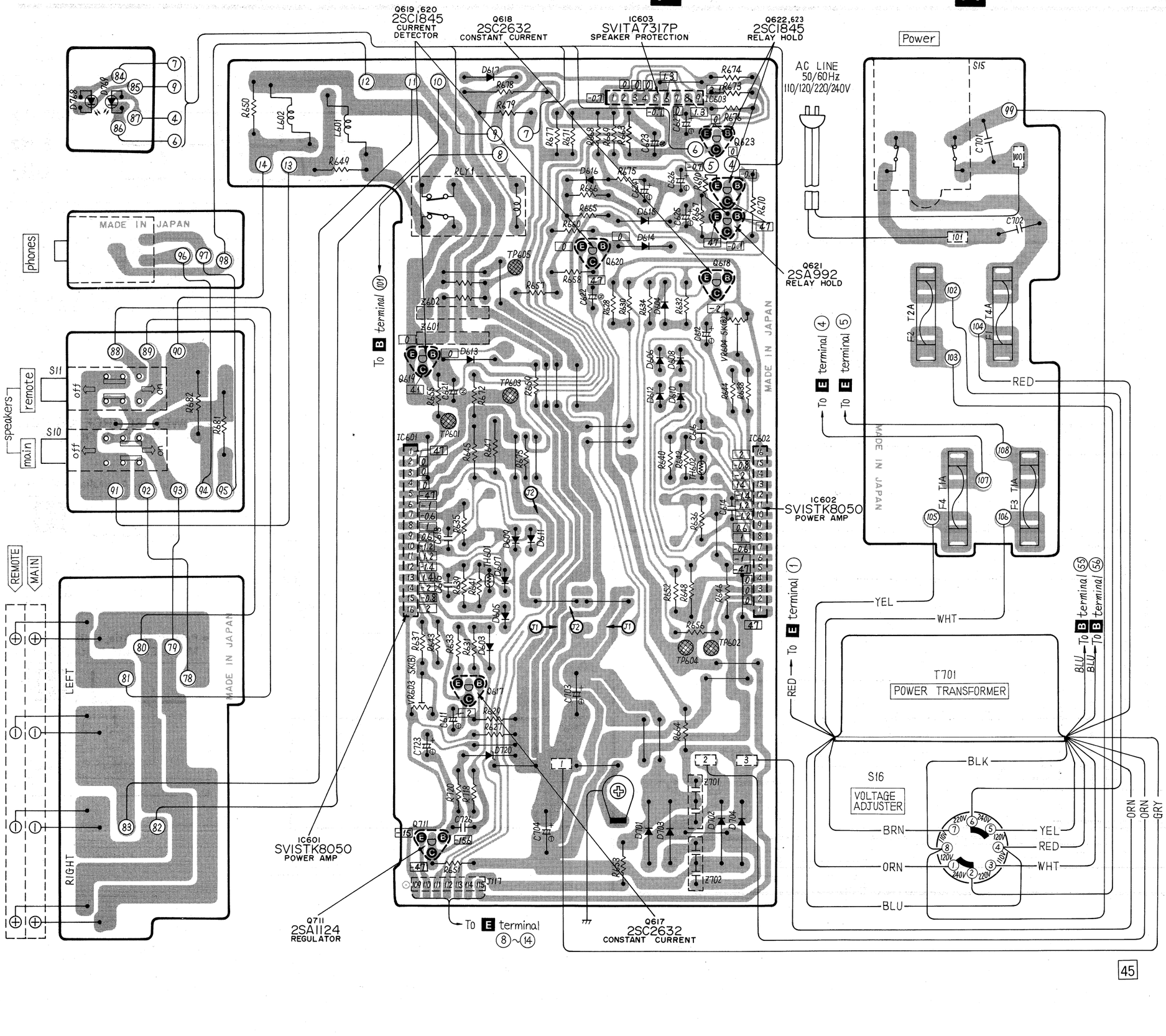
■ PRINTED CIRCUIT BOARD

Ground (Earth) lines

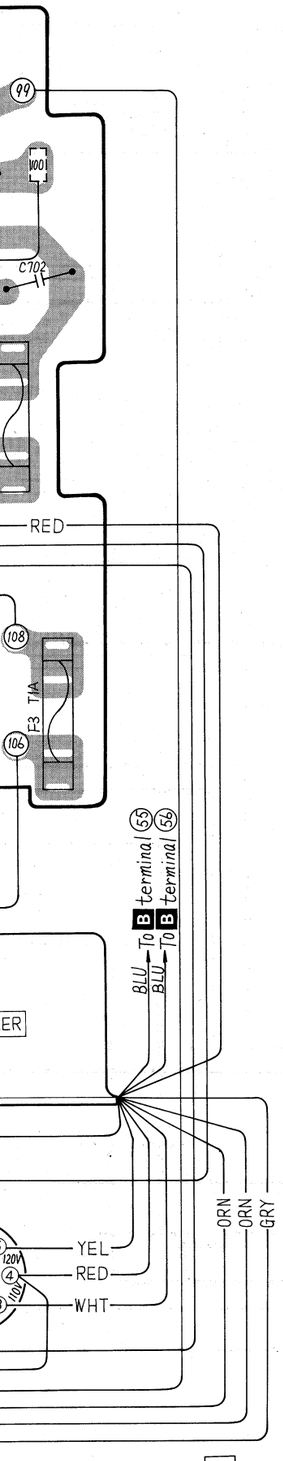
F Main amp & power source circuit

H Power source circuit

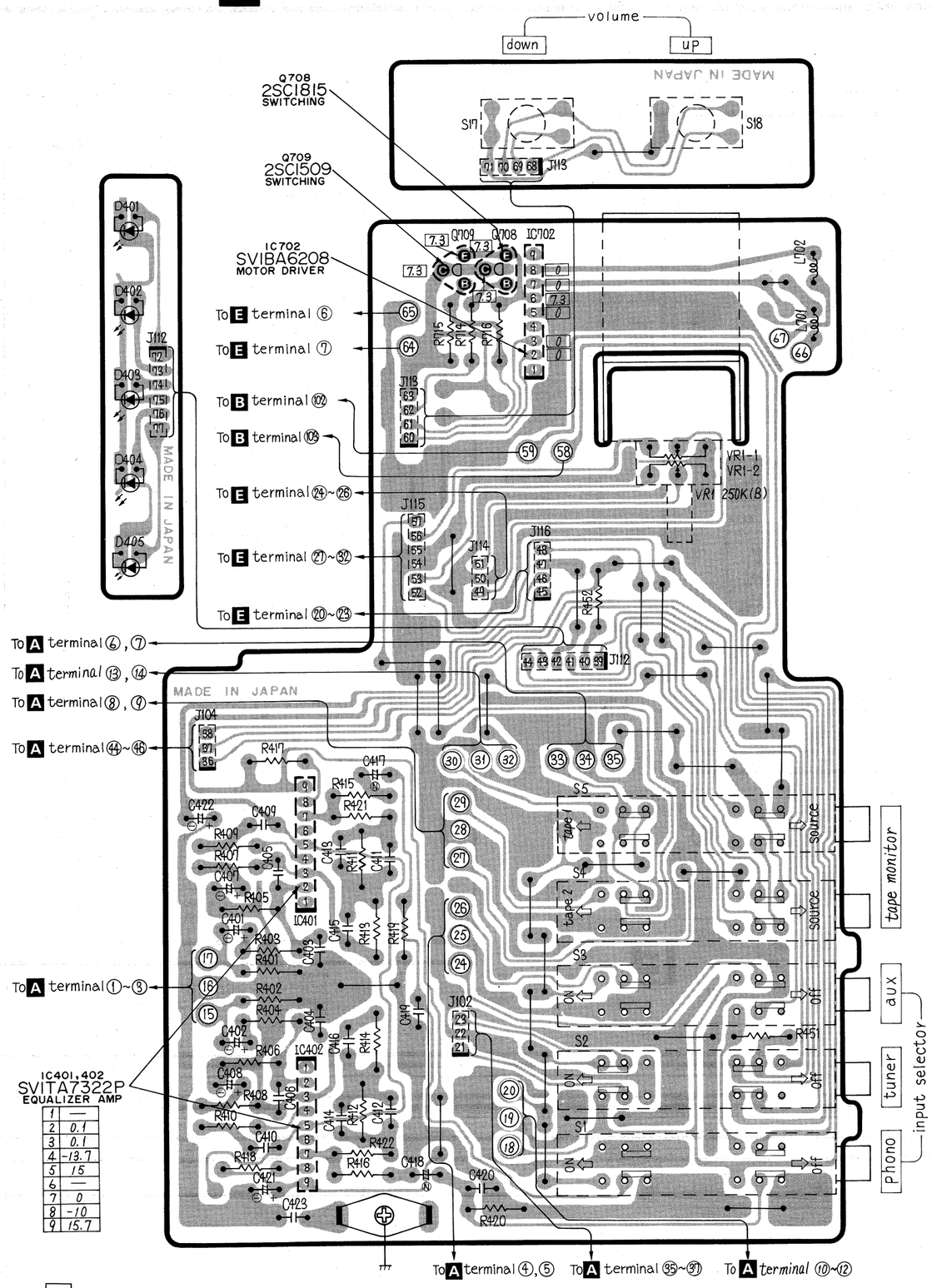
D Equalizer & volume contr



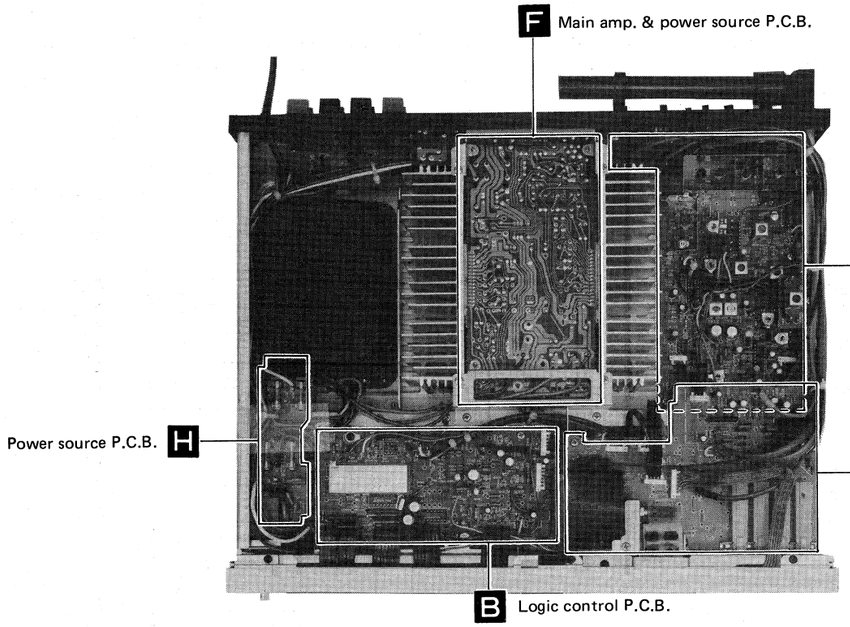
Power source circuit

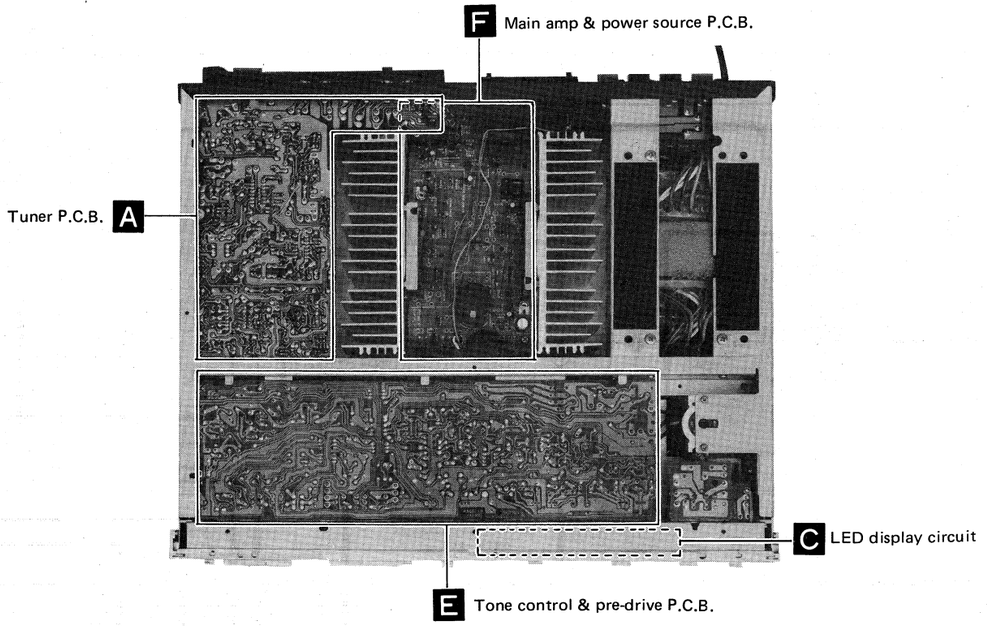


D Equalizer & volume control circuit.



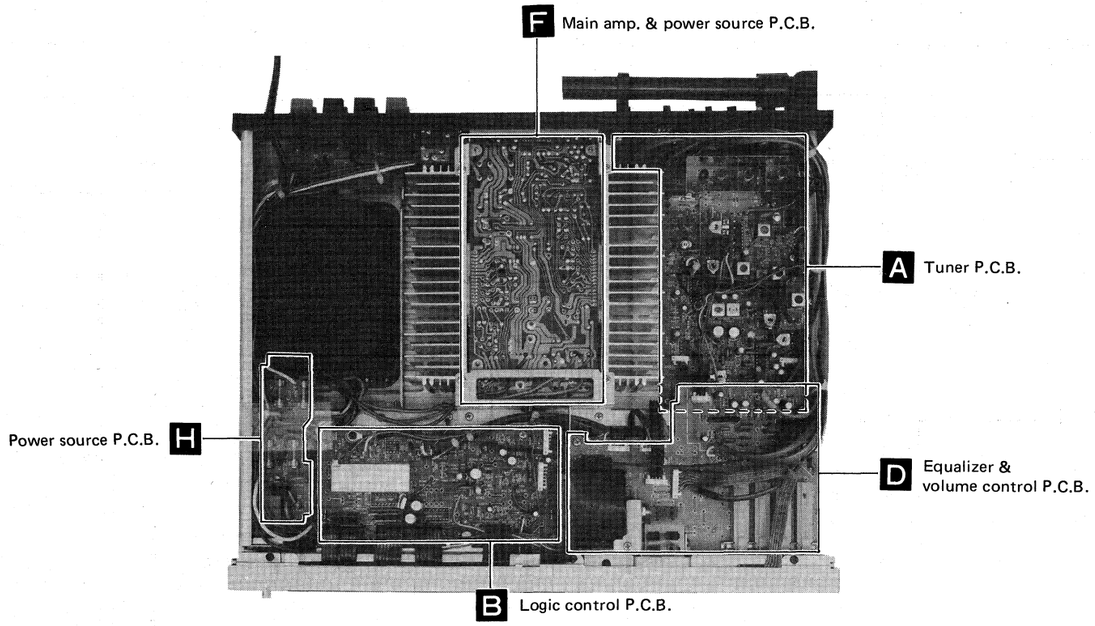
■ LOCATION OF P.C.B.

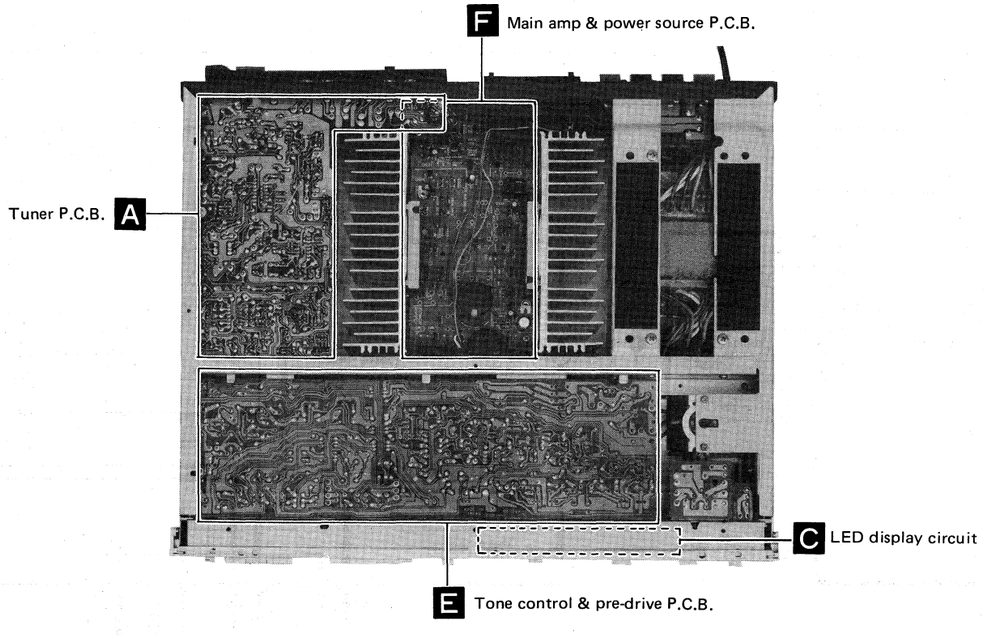




Bottom view

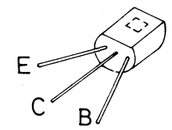
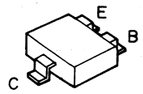
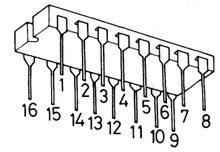
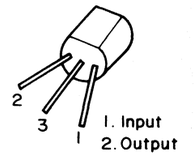
■ LOCATION OF P.C.B.





Bottom view

■ TERMINAL GUIDE OF TRANSISTORS & IC'S

2SC2320L, 2SC1815, 2SA666AI, 2SA1015, 2SA1124, 2SC1684, 2SA1123, 2SC2631, 2SC1845, 2SC2632, 2SC1509	2SC2295, 2SC2404, 2SB709, 2SD601, 2SC2778, 2SD601, 2SD601A, 2SB709A	SVIμPC1167C2, AN217PBB, AN363N, SVITC5067BP, SVIM74LS42P	SVITA78L006A
			
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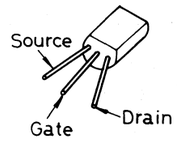
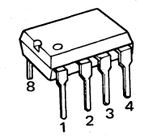
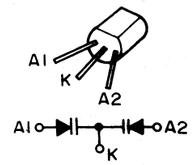
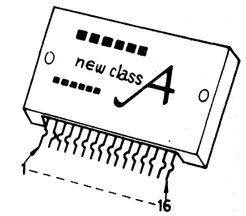
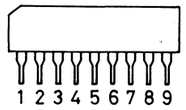
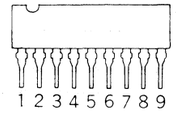
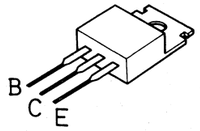
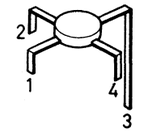
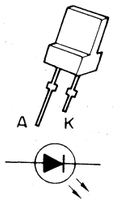
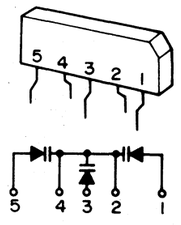
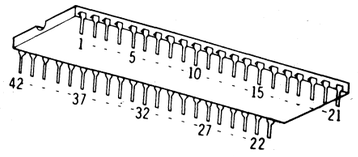
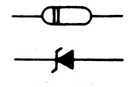
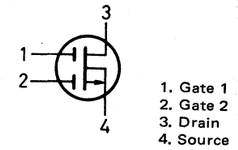
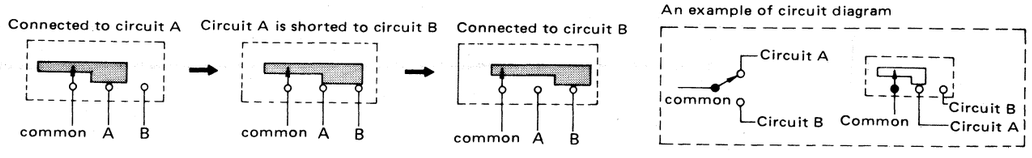
			
SVITA7322P, SVITA7317P	SVIBA6208	2SD880, 2SD762	3SK74-L1
			
LN417YP, LN217RP	SVDBB113	SVIμPD1704CL	
			
		SVDMZ□□□□	
			



● Shorting Switch

This unit uses a shorting switch. As illustrated below, the circuit is shorted to the next circuit without being opened. In the circuit diagram, the shaded area represents the common terminal.



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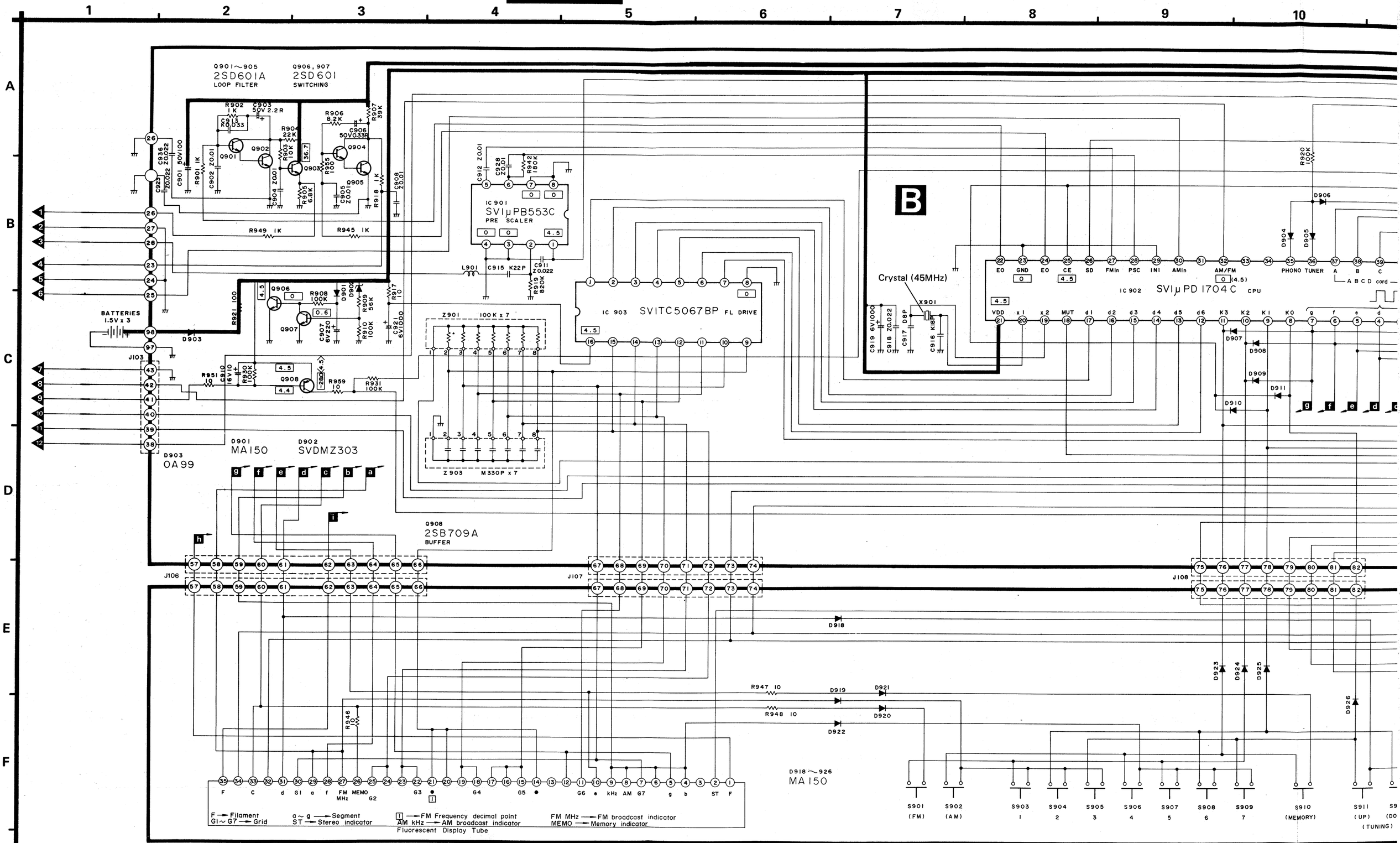
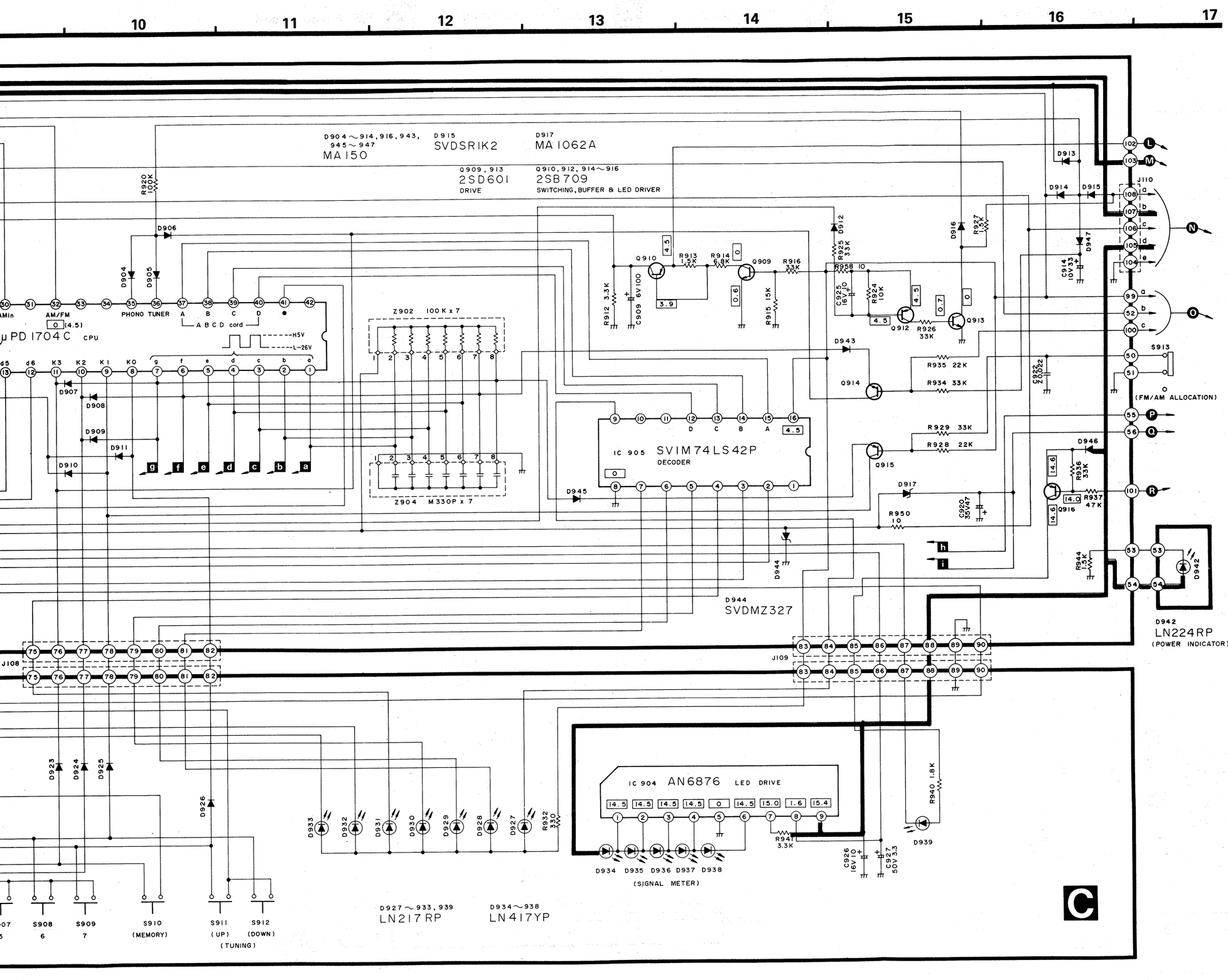
■ SCHEMATIC DIAGRAM (B and C P.C.B.)·····MODEL SA-515

(This schematic diagram may be modified at any time with the development of new technology.)





Notes:

1. **S1～S3:** Input selector switch in "tuner" position. (S1: phono, S2: tuner, S3: AUX.)
2. **S4, S5:** Tape monitor switch in "Source" position. (S4: Tape 2, S5: Tape 1)
3. **S6:** Audio muting switch in "0dB" position. 0dB ⟷ −20dB
4. **S7:** Loudness switch in "off" position.
5. **S8:** Subsonic filter switch in "off" position.
6. **S9:** High filter switch in "off' position.
7. **S10, S11:** Speaker selector switch in "main" position. (S10: main, S11: remote)
8. **S12:** FM IF band selector switch in "normal" position. normal ⟷ norrow
9. **S13:** FM muting/FM mode selector switch in "on/FM auto" position. on/FM auto ⟷ off/FM mono
10. **S14:** Automatic – scan switch in "on" position.
11. **S15:** Power source switch in "on" position.
12. **S16:** Voltage adjustment switch in "240V" position.
13. **S17:** Volume "down" switch.
14. **S18:** Volume "up" switch.
15. **S101:** FM antenna selector switch in "normal" position. normal ⟷ tuned type
16. **S901:** FM tuner selector switch.
17. **S902:** AM tuner selector switch.
18. **S903～S909:** Preset tuning switch. S903 – 1ch, S904 – 2ch, S905 – 3ch, S906 – 4ch, S907 – 5ch, S908 – 6ch, S909 – 7ch
19. **S910:** Memory set switch.
20. **S911:** Manual tuning "up" switch.
21. **S912:** Manual tuning "down" switch.
22. **S913:** FM/AM allocation selector switch in "FM 0.05MHz/AM 9KHz" step position. FM 0.2MHz/AM 10KHz ⟷ FM 0.05MHz/AM9KHz
23. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high – impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
    * Figures in ▭ stand for DC voltage in FM/AM signal reception mode.
    * Figures in < > stand for DC voltage in FM stereo signal reception mode.
    * Figures in ⌐ ⌙ stand for DC voltage in FM (no signal) muting to on mode.
    * Figures in ( ) stand for DC voltage with the FM/AM selector circuit set at AM.
    * ▭ marked terminal: 5V or 0V output.
    * ▭ marked terminal: 5V or −26V output.
24. Transistor and IC terminals which carry no voltage indication emit 5V pulse waveforms or are subject to change according to the frequency or input signal levels.
25. Signal lines
    - FM/AM composite signal
    - Audio frequency signal
    - Positive voltage lines
    - AM signal
26. ⚠ indicates that only parts specified by the manufacturer be used for safety.

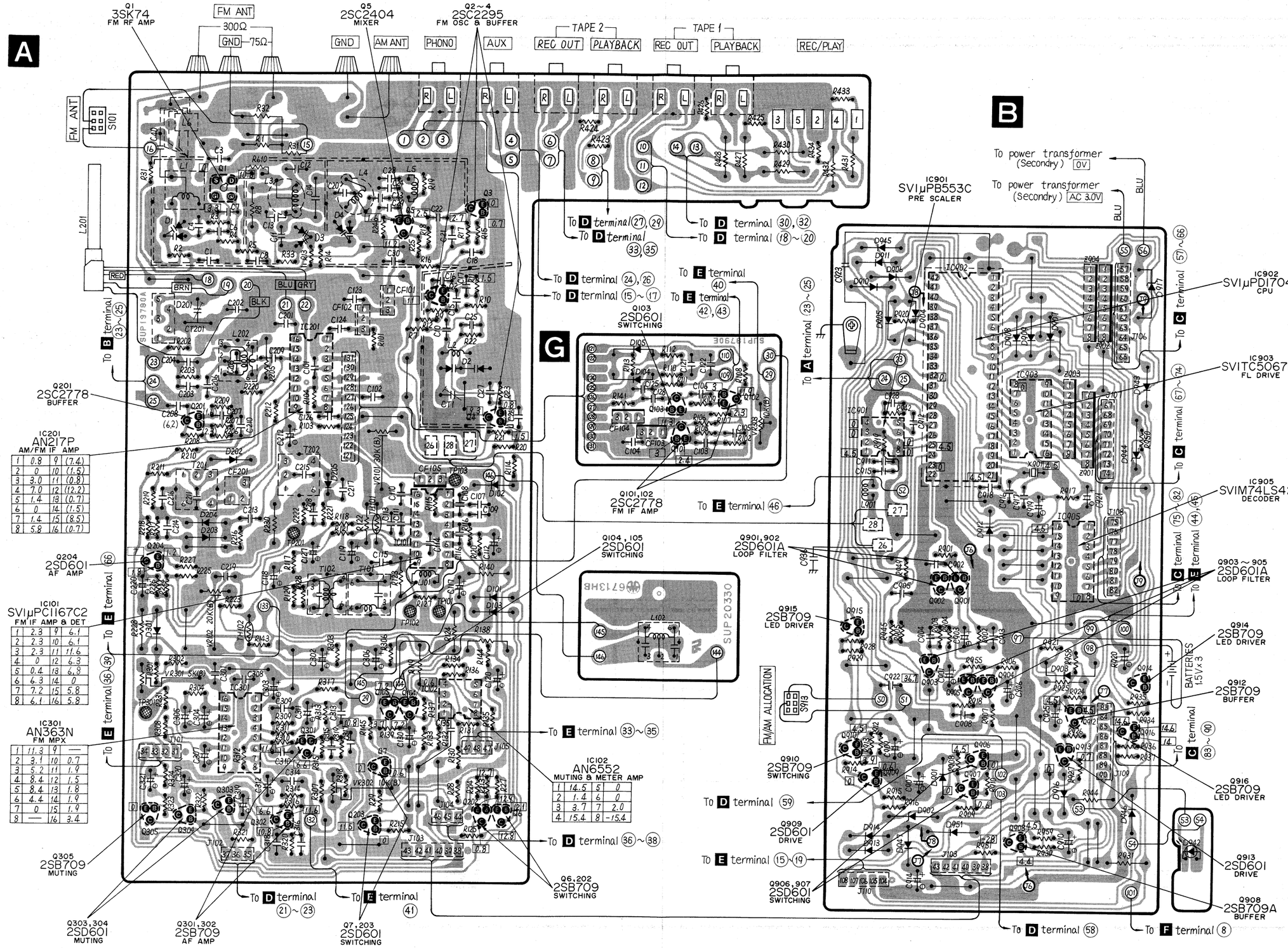
■ PRINTED CIRCUIT BOARD

Ground (Earth) lines

A Tuner circuit

B Logic control circuit

G FM IF amp. circuit



IC201 AN217P AM/FM IF AMP			
1	0.8	9	(7.4)
2	0	10	(1.5)
3	3.0	11	(0.8)
4	7.0	12	(12.2)
5	1.4	13	(0.7)
6	0	14	(1.5)
7	1.4	15	(8.5)
8	5.8	16	(0.7)

IC101 SV1μPC1167C2 FM IF AMP & DET			
1	2.3	9	6.1
2	2.3	10	6.1
3	2.3	11	11.6
4	0	12	6.3
5	0.4	13	6.8
6	6.3	14	0
7	7.2	15	5.8
8	6.1	16	5.8

IC301 AN363N FM MPX			
1	11.3	9	—
2	3.1	10	0.7
3	5.2	11	1.9
4	8.4	12	1.5
5	8.4	13	1.8
6	4.4	14	1.9
7	0	15	1.9
8	—	16	3.4

IC102 AN6552 MUTING & METER AMP			
1	14.5	5	0
2	1.4	6	0
3	3.7	7	2.0
4	15.4	8	-15.4